

1888.
VICTORIA.

P-3157

SANITARY CONDITION OF MELBOURNE.

CONTINUATION OF MINUTES OF EVIDENCE

ROYAL COMMISSION TO ENQUIRE INTO AND REPORT UPON THE
SANITARY CONDITION OF MELBOURNE.

PART II.



1889.

VICTORIA.

SANITARY CONDITION OF MELBOURNE.

CONTINUATION OF MINUTES OF EVIDENCE

OF

ROYAL COMMISSION TO INQUIRE INTO AND REPORT UPON THE
SANITARY CONDITION OF MELBOURNE.



13
By Authority:

ROBT. S. BRAIN, GOVERNMENT PRINTER, MELBOURNE.

4506. The freezing arrangements are on a small scale here?—They tell me it does not pay them. I forget what it is from Saturday night to Monday morning; but, in addition, there would be the cost of sending to the place and getting it back; it only would pay for the choicest joints.

George Howat,
continued,
21st Aug. 1883.

4507. Is there any other point on which you desire to supplement the evidence already given?—No.

The witness withdrew.

Arthur S. King sworn and examined.

4508. *By the Board.*—Do you generally concur in the evidence given on behalf of the stock agents of Melbourne?—Yes, in that statement that has been handed in.

Arthur S. King,
21st Aug. 1883.

4509. Do you desire to supplement the statements just made?—I would like to say as to the smells that have been spoken of at Flenington, as arising from abattoirs, that at the Johnston-street Bridge, in Collingwood, the smells are just as bad, and there are no abattoirs there. All the bad smell there is from the soap factories and tanneries.

4510. Is it your opinion that those noxious trades in the Saltwater valley should be allowed to remain in their present position near the abattoirs?—I do not think the smell hurts the meat, or ever can; but still, if that could be rectified and the smells avoided, so much the better for the place. The fact is this, that in summer a large amount of refuse products—bones and so on—from butchers' shops must be taken away somewhere.

4511. That being so, should noxious trades be allowed to remain in close proximity to the abattoirs, where cattle are killed and meat is hung?—I think they should be moved from Melbourne; but I do not think there is any necessity to move them away from the abattoirs. I do not think it would hurt the meat at all; but I think, as to the noxious trades, that there should be some way of stopping the smells or getting rid of them.

4512. You mean simply because they are offensive?—Yes.

4513. You do not think it contributes towards decomposition, or has any influence on the atmosphere as regards meat?—No, I do not think it hurts the meat, not for the short time the meat is there. The meat is only there perhaps eight or ten hours until it is taken away into Melbourne.

4514. Is it not a fact if you once have decomposed meat in a safe, and you put in other meat, you have the risk of having it all tainted?—I do not know that; still that would be in close proximity, two bits of meat hanging together.

4515. I mean tainted meat that has been there?—I dare say if you did put a piece of tainted meat in a safe it would spoil the other.

4516. If you have the smell of tainted organic matter in the Saltwater valley, must not that be prejudicial to meat hung there?—I do not think so. I think very close proximity would be needed to do harm. Then as to the inspector, I think if we have a good inspector—a man who would look after his duty—a great deal would be saved for the stock both in the market and in the yards at the abattoirs.

4517. You mean an independent inspector both at the central abattoirs and the suburban ones?—Yes. You asked the previous witness a question as to whether the stock would eat the hay. I can speak with authority on that, because I have been largely in the way of shipping cattle, and I notice the stock take to eating the hay the very night they are put on board; also, I have fed stock at the market yards, and they will eat the hay the first night.

4518. That is the general rule?—Yes; if they are fed on hay, they will eat it.

4519. Butchers and others say it is no good putting hay before wild cattle in the bare accommodation paddocks?—I would not believe them.

4520. Is there any other matter you desire to speak upon?—I may mention this, as to the yards and the abattoirs being at the best available site. Some twenty years ago we could not get the City Corporation to do anything for us in the way of giving us proper yard accommodation, and a large deputation of salesmen and leading butchers was formed, to go and find a place within twenty miles of Melbourne, anywhere, so that we could form a joint stock company to establish a market independent of the City Corporation. We could see very well it would be a splendid speculation, and we were very anxious to find a place, and for weeks we looked about and went out in cabs in all directions, and after weighing all the pros and cons, and considering the advantages and disadvantages, and so on, we came to the conclusion at last that we could find no place like the present, either for abattoirs or for yards, but we kept up the agitation until we forced the City Corporation to erect good yards. Now, in that case, there was a large deputation, trying to get a better place, and yet we could find no place so suitable as the present; and I may say I am of the same opinion still. Mr. Dougharty was one on that deputation. He knows how we went all round Melbourne for miles, and how there was a large deputation of butchers and others, and that we had calculated how we could make a lot of money out of it. It would have been the finest thing which could have happened to us if we could have got a better situation and formed the company.

4521. What was the chief condition you could not satisfy?—To get a place for abattoirs with sufficient drainage near where we would have the yards.

4522. Would not the provision of desiccators, if there had been any in those days, remove that difficulty?—I dare say it would; no doubt it would.

4523. Then your argument does not hold for the present time?—Another great argument was, we could not get any place near the railways that would suit the different lines of railway.

Arthur S. King, *continued*,
21st Aug. 1888. This present place is the receptacle for all the different lines of railway, the Sandhurst, North-Eastern, Gippsland, Ballarat, and Geelong lines all coming into one centre.

4524. Would not that be met by an establishment on each great line?—I do not think it would answer so well as at present, where all come into one market. The great disadvantage of having the market on each side of Melbourne is that we find one market opposing the other. If we have one on each line, there would be three or four markets in opposition.

4525. Would that be any disadvantage to the general consumer?—It would be a great disadvantage to the owners of stock, because they would not know which market to send to; we could never satisfy the owners as to which was the best market.

4526. With all those different establishments, why might the meat not come into the central depôt and be kept there, subsequent to the actual selling of the live beasts?—The stock would have to be sold somewhere, and therefore they all ought to come to one market to be sold. You could not get an owner of stock to set a value on his stock at the loading stations.

4527. In London, are you aware that they have no central market?—I have always heard of everything coming to Smithfield. I have no knowledge of the London market, but I always understood that all the stock was sold at Smithfield.

4528. If there were abattoirs on each line, the difficulty that you say would be felt by owners as to which market to send to would naturally disappear, because he would naturally send it to the one next his own place?—Then who is to buy the stock? Now he sends to this market, and everything is made quite easy for him. If he sends his stock into abattoirs up country, he does not know what he is going to get, and it is very hard to satisfy him that he gets market value for his own stock.

4529. Even if it were necessary for the cattle to come down on account of the grower, could they not be killed, and then sold on his behalf?—That has been tried already from Wangaratta and Gippsland. A man went to great expense and had a railway running right into his slaughter-yards. He tried it for a short time, and sent in ten or twenty head of cattle at a time into the metropolitan market, but it never satisfied him.

4530. Was that not through having no proper dead meat market, with chilling rooms?—No; it was done in the winter time. The owners gave up sending, and would never send the stock into the dead meat market to be sold that way. They like to see the cattle sold, and they come down and scrutinise everything that is done about the sale, and see that the stock are sold in a proper way. A man with ten head of cattle will follow down and see that he gets his proper value, but when they sent the dead meat from Rosedale, Flynn's Creek, or Wangaratta they could not satisfy themselves that it was done properly, and gave it up. The owners tried it, and lost money.

4531. How do you arrange for sales now?—The men with 10 head of cattle, or 50, or 100, sends his stock down to Melbourne. They are met at Flemington at the railway station, and taken over to the yards and put into the pens.

4532. Every day?—No, two days a week sometimes one; very often only one. Everything is jammed into one day if possible. When there are more than enough stock for one day they sell on the two days.

4533. I presume the agents sell the one after the other?—Yes.

4534. Could not they do that at three or four yards in the same way—sell, say, on Mondays at Gippsland?—There would be very great difficulty. Years ago, when the trade was not a third of what it is now, that plan was tried on the Gippsland side—selling one day at one place and on another day at another, but never made it pay to satisfy the owners. There were continual rows. Stock would be sold on one day, and a man would watch the market at the other place the following day, and say, "I would have got a pound more for the stock here." The same plan was applicable to Sydney. In Sydney they used to have yards in different places; but now they adopt our plan of selling in one market. And that is the reason why, if you have sale-yards on the different lines, you could never satisfy the owners as to what day they should sell.

4535. On the other hand, if one man felt he had lost by not holding over for the other market, would not the Gippsland man who got the £1 additional be satisfied?—Yes, and the next week he would probably lose and be dissatisfied.

4536. Does not that apply to all markets?—No, as we have it now all come into one market, and there can be no grumbling and no advantage taken one over the other.

4537. Does it not appear to you, if some such system as I sketched out to a previous witness were established, with proper chilling chambers, and so on, that we should get constancy in prices, which would remove all that?—How is that to be done, how is the man with ten head of cattle at Echuca to send his cattle? Are they to be killed and chilled up there, and to be sent to a settled depôt and wait there to be sold?

4538. I myself cannot see any difficulty. He would have them killed at Echuca, and they would come down?—They might be waiting for a chance of being sold, and then the man up there would never believe he got his own stock sold, unless he got what he fancied they ought to have brought.

4539. Why could it not be worked by a company working at Echuca?—From past experience, I am sure you would find great difficulty in getting people to form a company. That is one of my greatest objections to the chilling, owing to the money that has been lost heretofore in such attempts.

4540. Even if the Government provided the chill rooms and let them at certain prices, would there still be an objection?—I think capitalists would be very chary of having anything to do with it.

4541. Even if great pains were taken to explain the difference between chilling and freezing?—Yes, when people have been once hit they do not like to be hit again. Farmers and other people if you gave them twelve months or eighteen months of it, I believe would be very glad to give up the chilling; the difficulties are so great in the summer time.

4542. It seems to me that the difficulties in summer are merely mechanical?—I see so many difficulties in the way of the man with ten head of cattle.

4543. Say it was at Echuca, and those were purchased by the local company, and killed, and chilled, and sent down to the market to the chilled rooms and there be disposed of?—The great difficulty would be to get the owner with ten head of cattle to take a proper price.

4544. Then, if not satisfied, he could send them by train and get them killed?—Then he would not know if he got his own stock when he got them into the dead meat market, or their proper value. We salesmen can talk from experience about the small men. The big owner you might deal with, but the men with ten and twenty head of cattle are the men who would tell you the places where the chilled rooms would be wanted, and they would agitate till they got them established wherever there is now a trucking yard.

4545. Would it be necessary to have the chilled rooms at such a large number of places, taking the experience in America where they kill for a very large tract of country at Kansas?—They are the very large holders of stock, not the small owners of Victoria. You would be surprised to come to the yards and see the number of stock sent in small numbers—two, and three, and five—perhaps a truck made up by three owners.

4546. I do not see why they should not be sold together to a limited number?—You mean to companies?

4547. By co-operation among the small holders?—We have had a taste of co-operation; we had a Mutual Stock Company at Gippsland. They were going to have their own company to sell their stock, and everything done on the co-operative principle, but they very soon came to grief; they could not agree amongst themselves. There are great difficulties; I have weighed it over and over again in my mind since I knew I was coming before you, to see what was best to be done, and I know that there are very great difficulties.

4548. Suppose there were no rooms for chilling at Echuca and Bendigo, and you adopted the present system only of trucking down to a place within ten miles or fifteen miles of Melbourne, and that you have three or four centres on the railways, what would be the difficulty then of selling the small owner's ten head of cattle. If there is an average requirement for 90,000 head of cattle in the colony, and the price of the meat averages £10 per head, why should it fall off because there is a distribution of places; the consumption is the same although there are twenty places?—Do you mean that they would come down to a place fifteen miles out of Melbourne and then be sold there in the sale-yards?

4549. Yes?—There would be no more difficulty there than here at the present place, but it would not be so convenient a place.

4550. Suppose, for the sake of health, that you selected four or five places round here, miniature Newmarkets, with your abattoirs and sale-yards close to a train, would there be any difficulty then in selling the small man's stock?—We would get less prices, and we would never be able to satisfy the small owner that he got proper prices if we sold in different markets on different days.

4551. Do you satisfy him now?—Yes, because the stock all come to one centre. The only cause of complaint is that a man may say—"If my cattle had been sold at twelve o'clock instead of at three o'clock, I might have got a little more."

4552. Can you ever satisfy those men?—Yes; for now everything comes to one place and is sold there, and a man has nothing to say except that they may have been sold an hour too soon or an hour too late. The yards are called the convincing ground, and there is no dispute whether the market is good or not: they have to be sold.

4553. Is there anything further you desire to add?—No, except as to the labour. I see great difficulties about the labour question in the country. The labour is generally difficult enough to get, even in Melbourne, and I think if you got the butchers to give their evidence as to the difficulty of getting slaughtermen to do their work properly here, and how hard it is to keep them together, you would conclude that there would be a tremendous difficulty anywhere up the country, where they would have to live away from their wives and families. They would be told, "We do not want you for three months at a time, there being no stock to kill," and you would have to transport them to another place after they had formed their homes; men must have a little comfort if you want them to work steadily.

4554. I fully understand if there were any proposal to have a system of abattoirs and cooling rooms at all the towns you have submitted in that long list, but I do not think any member of this Commission ever dreamed of having such a number of establishments. The idea was to gather the bulk of the meat trade into a few centres, and then, it seems to me, at least, that there would be at those few great centres constant work for the men employed, and that the small amount of trade remaining over would come down to Melbourne in the ordinary course as live stock, and be sold here?—The small farmers now with their few head of cattle will agitate the Government till they get a railway siding as near to their places as possible. They will not drive ten miles out of their way if they can get the railway yards for trucking, and that would be just the same when it came to chilling meat. At every little place along the line owners would agitate till they got the Government to provide a chill room. You will see those trucking yards along the line in Gippsland. Rosedale and Flynn's Creek are about four miles apart, and you would not get a Rosedale man to send to Flynn's Creek, or *vice versa*; he must have his own place, and they

Arthur S. King,
continued,
21st Aug. 1888.

will work away at the Government and the member of Parliament till they get the trucking yards; and on the same principle they would want their chill rooms wherever there is a trucking yard, and would agitate till they got them. I think you would find it just the same with the chill rooms as with the truckings. About the Riverstone meat, I was going to say, when first the place was established, I went to Sydney with my family for about three months, and all the talk was, "You must eat this chilled meat from Riverstone"; and we certainly had it, and we could see no difference between it and the meat that was slaughtered down in town, either in price, or quality, or anything else.

4555. It was not worse?—No.

4556. They claim that it is better?—I know they do.

4557. Is there anything further you would like to add?—I think not.

The witness withdrew.

Adjourned to Tuesday next, at half-past Two o'clock.

TUESDAY, 28TH AUGUST, 1888.

Present:

Professor H. B. ALLEN, in the Chair;

A. P. Akehurst, Esq.,

W. McCrea, Esq., M.B.,

C. Hodgkinson, Esq., C.E.,

R. Reid, Esq.,

Hon. James Campbell,

T. Girdlestone, Esq., F.R.C.S.,

Professor D. Orme Masson.

Benjamin Benjamin sworn and examined.

B. Benjamin,
28th Aug. 1888.

4558. *By the Commission.*—You are the Mayor of the City of Melbourne?—I am.

4559. Have you made any special study of the abattoirs question?—I have not.

4560.—Do you desire to remit all explanation as to details of the abattoir system and recommendations as to improvements to the Town Clerk, who is with you?—Yes. As far as I am individually concerned, I can say very little on the matter. In fact, it is a question I am not at all conversant with; but the Town Clerk is here, who will be only too happy to give the Commission the fullest information, and I have no doubt answer such questions as may be put to him to the satisfaction of the Commission. I can only say, as far as I am concerned in the matter, I can give you very little information concerning the abattoirs, beyond that I can state this much, that it is the desire of the City Council to make the abattoirs as perfect as possible; they are neither sparing expense nor labour in so doing; they are erecting now the latest improved desiccators for the purpose of doing away with the nuisance which is said to exist; and there is not the least doubt, when those are completed and the other improvements that are contemplated are made, that we will be able to make the abattoirs as nearly perfect and complete as and bearing favorable comparison with any other abattoirs throughout almost, I might say, the globe. However, the Town Clerk is here, who has had years of experience in connexion therewith and other city improvements, and he will place before you the fullest information at his disposal.

4561. Have you any idea as to the policy that ought to be adopted as to those abattoirs; do you think it is better for them to be in the city or out of it?—My own individual opinion is, that a better spot could not possibly be found; it meets the requirements of a very large number of the community and those who have a particular trade and calling in connexion with the disposal of cattle and slaughtering and such like. I have been given to understand by a very great number of persons interested in the trade that they are quite opposed to any change, and would be very sorry to see the abattoirs removed from the present position.

4562. As far as Melbourne is concerned, you think there could not be an improvement?—I think not.

4563. How as to the suburban towns and cities?—They get their supply through the abattoirs. I have no doubt some would like to see the abattoirs brought closer to themselves, but that would be only perhaps to suit their own purposes.

4564. Do you think it wise from the stand-point of health to have those abattoirs in the city?—It depends on how they are conducted and the facilities afforded for making them perfect.

4565. Do you think it is a good thing from the stand-point of safety to have the cattle brought through the town?—I imagine the position of the abattoirs is no different from what they are in other cities and smaller towns. They are bound to be within a reasonable distance.

4566. Why bound to be within a reasonable distance?—The reason I should give is so as to make it as convenient as possible for those whose business it is to take cattle there, and to lessen the cost of the production of meat to the consumer.

4567. What would be a reasonable distance, do you think?—Where the present abattoirs are situated.

4568. You are aware that one objection raised to the present site is that the ground is very low-lying; do not the improvements you contemplate include raising the surface?—The Town Clerk will be able to give you that information. I know this much: there has been a very large amount

of agitation going on for some time past by certain residents in the locality, but why and wherefore I am at a loss to understand, unless it is to meet their own requirements in the matter of seeing a large and valuable block of land disposed of so that they may ultimately benefit from it and very likely be the purchasers.

4569. Is the City Council in favour of having a siding close to the abattoirs?—Yes.

4570. Would not that remove many of the objections locally raised?—I have no doubt it would.

4571. Is there any further matter you would desire to make a statement on?—No, I shall leave the matter entirely in the hands of Mr. FitzGibbon who has brought certain books and notes to supply all the information. He has been connected with the Council over a third of a century, and is far better posted up in the details of the abattoirs than I am as a member of the City Council or occupying the position of Mayor of the City.

The witness withdrew.

Edmund Gerald FitzGibbon sworn and examined.

4572. *By the Commission.*—What is your address?—Anderson-street, South Yarra.

4573. You are the Town Clerk of the City of Melbourne?—I am.

4574. For how long have you held that post?—Since 1856.

4575. Can you furnish the Commission with a copy of the grant to the Corporation of the land on which the abattoirs are erected?—I can; I have not such with me, because I was not aware it would be asked for, but I can supply it.

4576. Will you kindly state shortly the history of the abattoirs site, and of the buildings erected thereon?—The history of the abattoirs is this: Previously to 1853 slaughtering was done by private slaughtermen, who obtained licenses from the Government to carry on slaughtering business; about that time, or, rather, in 1851, I think, notice was given by the Government to the slaughtermen that their licences would terminate at a certain date. The City Council requested the Government to extend the time, as there was not sufficient accommodation provided for slaughtering. The City Council also asked, with a view to providing such, that a portion of land should be given, for the purpose of erecting abattoirs upon it, at the foot of Batman's Hill, between Batman's Hill and the river bank; they applied for a grant of it. Still, I must carry my memory back and check the dates. Their first application was earlier than I speak of, because the application went from the Superintendent to the Sydney Government. The Sydney Government was chary of those grants, and finally what the Corporation got was a lease for some fourteen years of a site on the river bank at the foot of Batman's Hill, and the Corporation proceeded to erect buildings there. The discovery of gold brought a large influx of population, which pouring in at the rate of 1,000 a day, it became necessary to provide habitations for them, and, inasmuch as the houses were insufficient to accommodate the people, the Government was asked to sell land. They sold land to the north-west of the city. The object of the City Council in asking for the land at Batman's Hill was, that from the cattle-yards, which were then at the north end of Elizabeth-street, the cattle could without difficulty be driven around by the back of Batman's Hill to the abattoirs, which were to be erected on the river bank; and as we had no other means of drainage, the river would provide the necessary drainage, and also water which would be pumped up for the cleansing of the place and for the use of the building. After the influx of population, and when the land was cut up and sold, the mode of access from the cattle-yards to the abattoirs became proportionately difficult, and the separation of the two establishments was then a matter that rendered the position of the abattoirs unsuitable. The City Council subsequently, finding that to be the case, and desiring that the abattoirs and cattle-yards should be in close proximity, cast about to find some suitable place. There was a portion of land at Doutta Galla which the trustees of the racecourse had an interest in, but it was not used by the trustees, and they agreed to give it up for the purposes of the City Council. The City Council thereupon went into negotiations with the Government and sold the abattoirs building. They first gave the use of the abattoirs building to the Government as a shelter for the numerous immigrants who were unable to find accommodation at that time, and they subsequently sold the abattoirs building to the Government, and surrendered their lease of the abattoirs site, and also their grant of the cattle-yards site, at the north of Elizabeth-street, and received in exchange for them the land in Doutta Galla, upon the Saltwater River, the recommendations of that site being that the distance was not inconveniently far from the centre of population, that the population around it was sparse, and that the existence of the racecourse would at all times prevent the probability of any population coming close around the abattoirs. Such portion of the land as was high, the hill was appropriated for the cattle-yards—some 24 acres; the remainder of the land, some 57 acres, extending thence down to the Salt water River, was low, but with a portion of it sufficiently high to constitute a site for the abattoirs buildings. The Corporation made all these arrangements in 1855, and in 1856 the official transfer took place. The Corporation surrendered its lease and grant, and received in return a grant of the cattle-yards and abattoirs sites. Subsequently, having built the cattle-yards in 1859, the City Council invited competitive designs for the erection of abattoirs according to the best plans that the ingenuity of the competitors could suggest. They had a number of plans, some of them very elaborate; but the most practical of them was one by Mr. William Elsdon, who was then, as he was for long afterwards, the Engineer-in-Chief of the Hobson's Bay Railway Company. Mr. Elsdon received a premium, and superintended the erection of the building, and the abattoirs were notified as being ready for opening in December of 1860. That, I think, is the preliminary history.

B. Benjamin,
continued,
23th Aug. 1883.

E. G. FitzGibbon
23th Aug. 1883.

E. G. FitzGibbon
continued,
23th Aug. 1888.

4577. Can you furnish the Commission with a plan of the abattoirs site and buildings?—I can. I have some plans with me, but they would not show them as they are now. I have plans showing intended improvements, but I can furnish plans showing the present position.

4578. Was the tenure of the land given up by the City Council the same as the tenure by which you hold the present abattoirs?—More advantageous.

4579. To whom?—The Corporation. A wrong was done to the Corporation in the grant of the abattoirs without any intimation to the Corporation of any intention to alter the grant. It was not until I had received the grant that I found there was inserted in it the unusual condition that if the land remained unused for the purpose for which it was granted for twelve months, such failure to use the land should incur a forfeiture. It was of no consequence, because the land was taken for the purposes for which there was a determination to use it; consequently no forfeiture was incurred.

4580. Was your first tenure a freehold?—It was a grant for the purposes of cattle-yards, and without such condition that I speak of; that condition was introduced by Captain Clarke.

4581. Will you kindly state now what, in your opinion, are the chief defects of the abattoirs as at present constituted?—That, whilst they were the best that the judgment of the engineer could suggest at the time, they are not such as we should erect now, and we have made various arrangements in the meantime, and contemplate making very important alterations of them as they are. The original buildings were too low, and probably insufficiently ventilated; as at first built, also, the walls were too rough, so that the inner faces of the walls were likely to retain the blood on the rough surfaces of the stone; that has been cured subsequently by cementing the walls up for a certain height, and the accumulation of blood was provided against by the places every week being lime-washed down throughout.

4582. What other defects do you propose to remedy?—The principal remedy to be applied is the improvement of the height and the ventilation of the buildings; and to amplify the space—give more room and more accommodation, a greater height, and more ventilation.

4583. Do you propose to modify the general slope of the land around the abattoirs?—Yes.

4584. In what way?—By raising the level of the ground from the slope of the hill at the cattle-yards to the Saltwater River.

4585. Is there any other proposal which the Council intend to carry out in the way of improvement?—They intend planting around the whole area, and already they have in hand the grassing of the paddocks.

4586. Is it intended to provide any further shelter in the paddocks beyond the shelter of planting?—The yards in which the cattle have to be kept immediately before killing are to be roofed over.

4587. Is there any structural change proposed?—Yes, from what is erected the two flanking quadrangles have been found unsuitable, and are to be done away with.

4588. Do you propose, if possible, to bring a siding down to the abattoirs, or to stop at the cattle-yards?—There has been no siding proposed except to the cattle-yards, and I doubt if any siding is necessary beyond that. The distance is so short into the city from the abattoirs that there is no difficulty in butchers carting their dead meat from the abattoirs into town by the ordinary roads.

4589. Having in view the supply of the suburbs of Melbourne from the abattoirs, do you think that such a siding should be constructed?—If the business of the abattoirs should require, of course the Corporation would be at once desirous to have such; but up to the present time there has been no suggestion for the necessity of railway communication from the abattoirs. There has been a desire to have railway communication with the cattle-yards; that was supposed to be furnished by the stages which were placed by the Railway Department within about a furlong from the yards themselves; but the roadways from those stages run through the town of Flemington, and the consequence is that the cattle have to pass through the streets of that town. The Corporation have been very anxious to have that done away with, and they communicated with the Government and with the railway authorities, not only they, but also the cattle salesmen, with the intention of getting the cattle to market with the least possible difficulty, and the result was that the Railway Commissioners agreed that it was a perfectly just application. It was a convenience which had already been afforded at Ballarat and at Sandhurst, and there was no reason whatever for refusing it to the City. The Commissioners, consequently, or the Government, asked for a vote from Parliament, and that proposal was before the Legislative Assembly in the last session.

4590. What is the proposal of the Council with regard to the disposal of the refuse matter from the abattoirs?—They have a building which is now being roofed in, and they have the machinery on the ground and in readiness for erection; it is all under contract to erect two of Sir James Farmer's desiccating machines for the purpose of disposing of all the refuse from the abattoirs.

4591. Do you think that when these various reforms have been carried out the condition of the abattoirs will be thoroughly satisfactory?—I think so.

4592. Do you think that any extensive alteration will be necessary in connexion with the supply of meat for Melbourne when such changes are made?—I do not.

4593. Have you familiarized yourself with the process of bringing cattle from distant parts to Melbourne for meat supply?—As far as the experience of the railway is concerned, do you speak?

4594. Yes, as to the main lines of traffic?—What I have chiefly observed has been, that some of the salesmen in what is called the Metropolitan Meat Market (that is the wholesale dead meat market in Hotham) have made essays at procuring and selling meat slaughtered in the country; but up to the present time, I understand that those trials have not resulted profitably.

4595. Are you able to state whether the arrangements now existing for the trucking of cattle and stock for the Melbourne Meat Market by rail are satisfactory?—That I cannot speak of, by any personal observation myself. I have heard complaints that cattle get bruised, and doubtless they do. Whether better arrangements can be made by the Railway Department is a matter that I have not experience enough to speak on.

4596. Are you aware whether any large numbers of stock are killed on the passage down?—Of course of that I have no personal knowledge; by the information given me there is not a large number killed on the passage down—only a very small proportion.

4597. Does that refer to the animals that die between the last shunting station and Melbourne, or does it refer to animals that die throughout the whole of the trip down, say from Wodonga or Echuca?—Again I must repeat that I have no personal knowledge on that point; that would be better spoken of by cattle salesmen who are concerned in the interests of their constituents.

4598. Are you aware, from personal inspection, whether a large proportion of the animals are seriously bruised in transit?—I am aware, by having seen at the abattoirs animals which were bruised, that some of them do get bruised; but I cannot say what proportion, and I am not led to believe that it is a large one.

4599. Do you think that the present mode of taking cattle from the Newmarket siding to the cattle-yards is satisfactory?—No, it is eminently unsatisfactory and cruel, and it is for that reason that the desire was that the railway siding should be made direct with the yards. I believe, so far as the irritation and trouble to the cattle themselves, that there is more irritation and trouble caused in the rushing and driving of them from where they are landed out of the trucks into the cattle-yards, than there is in all the remainder of the process; so that instead of the cattle being landed quietly into the yards, and there allowed to rest after their journey, as soon as they come out of the railway cattle trucks—they are then rushed and harried across through a roadway to get them to the cattle market.

4600. Have you examined the condition of the cattle in the cattle trains sufficiently to be certain of that opinion, or is it gathered from other evidence?—I have no personal knowledge; it is gathered from the information that has been given to me.

4601. What was the nature of the objections to having this siding?—That the inhabitants of Flemington and Kensington had made up their mind that whatever the consequences might be, the cattle-yards and abattoirs should and must be removed from Flemington, and that they would not allow anything whatever to be done which should in any way tend towards continuing the cattle-yards and abattoirs in their present position.

4602. They do not desire, in fact, to have the objections removed?—They were determined that the objections should not be removed, but that the objections should continue in all their offensiveness.

4603. Are those the reasons actually given against constructing this siding or the reasons supposed to be at work?—Perhaps the best answer to that would be by referring to what took place subsequently with regard to the proposed erection of desiccators; well, the Flemington Council wrote to the Corporation in Melbourne, protesting against the Corporation effecting the proposed improvement, because any improvement or any expenditure there would be only waste of money, because the cattle-yards and abattoirs must be removed.

4604. In your opinion could not many of the evils now attaching to this process of removing the cattle from the trains to the cattle-yards be removed by more effective supervision?—Where, at what point?

4605. If there were some experienced men placed in charge to control the untrucking and driving between the railway siding and the cattle-yards, could not the cruelty to animals and the mischief to which you have referred be largely removed?—I doubt it, because the time is very short. There are local by-laws which impose penalties for the driving of cattle within the municipal limits except within certain hours; it is, therefore, absolutely indispensable that the cattle should be rushed across with as little delay as possible to prevent offence against the restricted hours.

4606. As a matter of fact, are you aware whether really greater speed is obtained in the work by all the noise and rushing and galloping—does not the excitement which is produced in the animals prevent effective and rapid work?—That I am not expert enough to speak of. I apprehend, however, that the noise is made really to frighten the animals, and make them run; and, therefore, the more noise the more effective it is likely to be in scaring animals into attempting to escape, which is the object in resorting to it.

4607. Did any others, except the inhabitants of Flemington, object?—No, there is no objection to the cattle-yards or the abattoirs from any of the 400,000 of the inhabitants of Melbourne except the inhabitants of Flemington and Kensington, or those whom they have specially affected.

4608. Have not all connected with the trade expressed a favorable opinion of the establishment of a siding?—The cattle salesmen themselves applied for it, and they accompanied the City Council to the Minister in two separate deputations to beg that a cattle siding should be constructed into the yards; they were unanimous and urgent for it.

4609. The cattle being yarded at night and sold next day, what, as a rule, is then done with them?—If they be cattle for slaughter, they are driven across from the cattle-yards into the abattoir yards—the space between is only the breadth of the road—and are placed in the abattoir yards, there to remain until killed.

4610. Are you aware how long, as a rule, cattle are kept in the abattoir yards before they are killed?—Of that I cannot say from personal knowledge; I believe two or three days.

E. G. FitzGibbon
continued,
23th Aug. 1888.

4611. If a witness has told us that half the cattle are killed at once after the sale, are you enabled to contradict that statement?—No, I have not sufficient personal knowledge to speak on that subject.

4612. Having regard to the condition of the cattle which you have described, greatly excited by driving and shouting, do you think that their flesh could be wholesome if they were killed at once?—I would revert to the question you put to me just now. Whilst I have no personal knowledge as to what is the fact, I may say that I very much doubt any statement that the cattle are killed directly they are taken down to the yards from there. The information that I have acquired from experts is, that it is usual to allow some twenty-four hours before the killing of the cattle; but I say again that I only speak from the impressions I have received in conversation.

4613. It would not be likely, in his own interest, that the owner of the cattle would allow them to be slaughtered in that short time?—If by delaying the slaughtering of an animal for twenty-four hours the body of that animal could be ensured to be in better condition, it would be a better article to sell, and would produce a better price; and I cannot conceive that it would be any man's interest to hasten the killing of the animal, and thereby make the material worse, or to make it unwholesome.

4614. Is it not a fact that meat is very much better when obtained from cattle which have been rested for a week?—Of my own knowledge, I cannot answer that question. I should suppose that the quieter the cattle were, possibly the better they might be; but it would require greater experience than I possess to say that cattle are any way deteriorated by being killed at an earlier period than a week.

4615. Is it true that the better-class butchers keep their cattle for six or seven days in the paddocks before killing?—I have been informed that Mr. Bennet has paddocks to which he sends out his cattle. I apprehend that it would be all the better, it must be all good and no harm.

4616. My question was a more particular one with regard to the accommodation paddocks of the abattoirs themselves, whether you are aware that the better-class butchers keep their cattle in those accommodation paddocks for six or seven days before killing?—Of that, I again repeat, I have no personal knowledge. My impression is, that two or three days at a time the cattle are kept there; it may be the sale day is one, I think Tuesday or Wednesday, and the slaughtering day is usually on Thursday or Friday. If cattle were not slaughtered on the ordinary slaughtering day, they doubtless would stand over till the next, or probably they would stand over till the next week.

4617. Are you aware whether it is a fact that cattle kept for about a week lose a considerable per centage in weight, and that the butchers have to sacrifice this per centage of weight in order to get them in fit condition, properly cooled for killing?—No, I am not aware that such is a fact.

4618. Have you any information which would lead you to think that is not the case?—No, any opinion I have formed would be inference.

4619. Will you describe briefly the character of the accommodation paddocks in connexion with the abattoirs?—They are large yards, the upper one of them, nearest to the cattle market, has a basin which usually has water lying in it; rain lodges in it. The remainder of them are large yards.

4620. In the portion of the paddocks forming the slope of the hill, is there any grass?—No.

4621. In the portion of the paddocks lying on the level ground, does rain collect in large pools after any heavy rain?—No, I think not. I have never observed it.

4622. Is it at all a frequent occurrence for cattle kept in those lower paddocks to be up to their knees in mud?—No, not cattle kept in the lower paddocks; cattle going to the water, the water basin I speak of, that being a natural basin, would tramp in the edge of that water and would be in the mud when they went into the water; but there is no necessity for them to remain there. The cattle in the lower paddocks would not be as you describe.

4623. Is there other water for them to drink apart from those pools?—Yes, there are troughs supplied with the Yan Yean water.

4624. Then if statements are made to this Commission that cattle are frequently found in the accommodation paddocks up to their knees in mud, those statements are exaggerations?—Yes, they would be only true as to the water hole I speak of, wherein cattle going to it would be in mud.

4625. Are you aware whether it is possible to feed animals in those bare accommodation paddocks? Yes, I have seen the animals feeding in those bare accommodation paddocks.

4626. So that again, if it is stated that there is serious difficulty in getting animals to feed at all on hay for some days after they come from the country, you would say that is somewhat of an exaggeration?—I have seen the animals feeding on hay there.

4627. Are you aware from your own experience as to whether difficulty is found in that way, so that where it is necessary to keep the animals to get them into condition for slaughter they do not feed properly and lose seriously in weight?—I cannot speak, I repeat again, from personal knowledge, as to their losing in weight; but as to their feeding on hay and being fed with hay at the abattoirs and in the abattoir paddocks I should say, from personal observation, that they are supplied with hay and do eat it.

4628. If a witness says it is useless to throw hay before them, they simply trample it under foot, he is exaggerating?—He is exaggerating. I have seen to the contrary, he may have seen what he says, but I have seen the reverse.

4629. Do you think that cattle suffer very much in wet weather through being foot sore and being unable to lie down in those damp paddocks at the foot of the hill?—The paddocks there are only damp at the water hole, the remainder of the paddock in which that water hole is is a steepish slope and is not damp.

4630. Mr. Bennet told us the cattle are often very foot sore, and in wet weather they will not lie down, and standing up for days in those paddocks the feet get inflamed, and the whole body gets more or less irritated?—Mr. Bennet is an expert and can speak with far more knowledge than I can. I have not any such knowledge as he possesses as to animals, and whether animals, foot sore, will lie down or not, is a matter I cannot say; but as to lying down in damp paddocks, I say, except the portion I have already described, those paddocks are not more damp than ordinary land would be.

4631. Do you think there is sufficient room in the abattoir paddocks for the trade of Melbourne?—I think so, and for a considerable time yet to come, always provided that you do not want to pasture the cattle.

4632. But supposing it is desirable, as several witnesses have told us, to keep cattle for several days before slaughter, say something approaching a week, do you think then there is sufficient accommodation at the abattoirs?—Not for pasture; there is sufficient for keeping them and feeding them.

4633. But is it not the fact that Mr. Bennet has about 2,500 acres of land which he rents for his own purposes?—Mr. Bennet is a gentleman who carries on a very extensive trade, and has various establishments, and suits his killing to his own time and convenience.

4634. You think, however, that apart from such a special business carried on in special ways by a business man's own desire, that there is sufficient accommodation in those paddocks?—Abundance, and for a very much larger trade than is being done at present.

4635. What is the tariff for keeping cattle in those paddocks?—In the abattoir paddocks there is no tariff for keeping them there.

4636. Is a butcher equally at liberty to keep them one day or many days, without any difference in the charge?—The charge is for the slaughtering.

4637. And the accommodation is given in?—And the accommodation is given in for the slaughtering fee.

4638. Such accommodation extending over such time as the butcher may determine?—Oh! no. It would not extend to a man keeping animals for an inordinate time.

4639. There would be no difference if a bullock was kept one day or seven days?—I do not think there is any difference, that is speaking without looking into the matter, from my knowledge at the present moment.

4640. Can you give us definite information as to the proposals of the City Council as to the height to which this land will be levelled?—I have the plans here, and there is a gentleman who can very well check them—[*The witness exhibited and explained the plans*].—The City Surveyor is better able to give an explanation of this than I am.

4641. I see that this will abolish that depression that was alluded to?—Yes, we would have abolished that long ago; we wanted to turn over the hill that was there adjoining the cattle market, but the Flemington Council succeeded in getting it given them, and they removed the stuff some distance away to some place where they desired to place it themselves.

4642. You propose a fall of 1 in 580?—Yes.

4643. And you have at the bank of the Saltwater a height of $5\frac{1}{2}$ feet to $6\frac{1}{2}$ feet above the datum line which is the low level line in Hobson's Bay?—Yes.

4644. You have a fall of 1 in 580 evenly from the foot of the hill?—Yes, running down to the Saltwater River. As to the road which crosses between the cattle market and abattoirs land, the MacCauley road, it is proposed to raise it by embankment and make an archway underneath to connect the cattle-yards with the abattoirs. At present complaints are made that the cattle are liable to escape, and that is to be done away with by raising the road and making an arch under it from the yards into the abattoir paddocks.

4645. I understand, then, from the plans you have submitted that the City Council propose to extensively fill in the low-lying land from the foot of the Kensington hill to the Saltwater River, so that there shall be a uniform grade towards the river of 1 in 580?—That is shown by the plan.

4646. And so that the grade to the bank of the Saltwater River shall end between $5\frac{1}{2}$ to $6\frac{1}{2}$ feet above the low water levels of Hobson's Bay?—That is so. I was only going to say that I have a memorandum here of the City Surveyor's in regard to the contemplated improvements, and if you desire I will read it.

4647. Does it include anything further than what you have already spoken of?—It relates to the desiccators that are about being erected and something as to the levels—[*looking through the same*].—I see it is merely an opinion, so I need only add the estimate of the cost, £15,000.

4648. I understand that these works comprise an extensive filling in on the line of MacCauley road, so that it shall be possible to have an archway under it where cattle will be taken from the cattle-yards into the accommodation paddocks of the abattoirs?—Yes.

4649. I understand the average filling in would be about two feet?—I am speaking now of the surface, the entire area; but what I spoke of just now is the filling in the MacCauley road, which would be very extensive, which would rise to a height in the centre of something like 12 feet, probably, to give head room for the arch.

4650. Still, as far as the great mass of low-lying land is concerned, that is simply filled in about two feet?—That is my impression, but it is filled in to give a slope, the fall which is described in the plan. That low basin that I spoke of some time ago where the water lies, of course the filling will be much deeper there than upon the places that are a higher level in other parts.

4651. It is shown deeper on the drawings at that part?—Yes.

E. G. FitzGibbon
continued,
28th Aug. 1888.

4652. Will it be possible, do you think, to alter the levels of all that low-lying land without practically reconstructing the abattoirs?—A great portion of the abattoirs will be re-constructed. I have some sketches here showing those also, if you would like to see them.

4653. We would like to see them?—[*The witness produced and explained the sketches.*]

4654. I understand then from a short study of the plans which you have submitted, that it is proposed to do away with the two quadrangular killing places now contained in the abattoirs?—Yes, they are to be pulled down.

4655. And that those are regarded as having been constructed on a mistaken principle?—Yes.

4656. And that a large policy of re-construction will be carried out having much better ventilated killing places and giving abundant room for the keeping of animals in the yards, and additions to the killing places under cover?—Yes, far greater height and far better ventilation, and covering over all the yards adjoining the buildings.

4657. And that provision will be made to permit air to pass through freely in either direction?—That is so.

4658. That the killing places and approaches thereto will be practically on raised platforms?—Yes.

4659. Do I understand that the surface below the floor will be open so as to have ventilation beneath?—I cannot say that, I have not gone into the details as to that.

4660. I understand, further, that there will be an elevated tramway running through the abattoirs which will carry a suitable vessel, in which blood and refuse will be conveyed to the desiccators?—Yes.

4661. And that the blood and refuse made will be raised into this vessel on the tramway by hydraulic pressure?—Yes.

4662. The reason for that is, that it is not possible, according to the recommendations of the City Surveyor to have those platforms at such height as to permit of gravitation of blood and refuse matter into the tanks which would take those materials to the desiccators?—That is so.

4663. How long do you anticipate it will take to carry out all those improvements?—About eighteen months from now. The first thing, the City Council will presently be discussing its ways and means, and contracting a loan for various improvements, and this will be amongst them. Being in possession of funds there will be nothing but to call for tenders and carry out the work.

4664. Would it not be better if those killing places could be taken to higher ground for the sake of ventilation and drainage?—There would be one great disadvantage, the higher ground is nearer to habitations. The great advantage of the position the abattoirs are in at the present time is that they are absolutely isolated from habitations, and the old saw holds good "Conceit is worse than consumption." Put the abattoirs near to dwelling places, and make them as beautiful as they could possibly be made, and yet people would possess themselves with the idea that there was some unexplained deleterious principle coming from the abattoirs. Where they are at the present time there is no reason or justification for such a pretence as far as the abattoirs themselves are concerned. There is absolutely no offensive effluvium from the abattoirs.

4665. But as to management, would they not be easier to ventilate and easier to manage?—I have very little doubt, for instance, if up on the slope of the hill, or if instead of placing the abattoirs in the abattoir paddock at all, if it were placed on one of the hill slopes of the cattle-yards it would have this advantage: that the desiccator, instead of requiring hydraulic pressure to send the blood into it, could be constructed so that the blood could be passed down into it in the same way that the desiccator is at the Meat Preserving Company's works at Auburn, where they have a sunk chamber. It would be needless to sink a chamber because the levels would furnish a fall, but I am afraid that all the advantages that would be derived from that would be more than counterbalanced by the local prejudice of having the abattoirs any closer to habitations.

4666. That is the chief objection then?—Yes.

4667. If that could be overcome you would see the advantage?—But that, above all other things, I deem to be utterly hopeless; matters of engineering construction can be got over, but matters of fancy are beyond any engineer's capacity to cope with.

4668. Is there room on that ground that is adjoining the cattle-yards to erect abattoirs?—There would be room probably for the business that is carried on there at present, but there certainly would not be room for the prospective business. There are now people applying for accommodation at the abattoirs, and there is not room to take them in. There is as much work done there as the capacity of the building will allow at the present time. It will be necessary to extend the buildings, and I do not think there would be room for sufficiently extensive buildings on the slopes.

4669. There is not land left?—I am afraid not.

4670. For other abattoirs to come in?—No.

4671. Not enough acreage?—No; there is abundance of acreage down below, but not a sufficiency of the acreage of the high land.

4672. Would it be desirable to concentrate the outlying abattoirs and have them all together; could it be done?—I think it could be done, and I think there would be very great advantage in doing it, in consequence of the supervision which could be exercised.

4673. But, as regards room, there would be a difficulty?—Not on the site where the killing places are now. There is abundance of room there when the levels are raised.

4674. But not on the high ground?—Not on the high ground.

4675. Has any thought been given to the question as to how blood-stained fluid shall be kept out of the Saltwater River in future?—The blood will be caught, but as to the blood-stained fluid no thought has been given to that.

4676. Would it not be possible, in some similar way, to prevent any blood-stained fluid passing into the Saltwater River? It may be quite possible to clarify the water.

4677. Should not steps be taken in that direction?—I think that steps should be taken to remove all offence.

4678. Yet no steps have been taken hitherto in that direction?—The escape of anything except blood-stained fluid has been prevented as much as possible, but as to blood-stained fluid, one reason; perhaps, for that was this, that the Saltwater River is not a potable water; it is a tidal river, and there has been so little regard to providing for the absolute purity of rivers up to the present time that the mere escape of blood-stained fluid would not present itself as being anything very important; it would be desirable, decidedly.

4679. Do you think that the present management of the abattoirs is satisfactory?—I think so. I am not aware of any improvement that could be made in it.

4680. Do you think that the place is kept in as cleanly a condition as it can be?—I think it is kept in as cleanly a condition as circumstances will admit, considering the business that has to be transacted there. The place is cleansed out regularly. It is whitewashed every week after the termination of business. The principal business is on Thursday or Friday; then after the killing on Friday it is whitewashed, and is carefully swept out throughout. As to the water used there, I may say that one-fifth of the entire revenue of the abattoirs is paid for water, for cleansing, or something like one-fifth.

4681. But in the gutters, is not foul matter allowed to accumulate in an unnecessary way?—I think not. There are eight labourers and an overseer, and those labourers are engaged upon nothing else but cleansing the refuse and keeping the place clean and tidy; keeping the gutters, yards, and the whole place clean.

4682. Do you propose in the new abattoirs to have entrails and their contents lying about, mixed with blood, in the same fashion as now?—At present they lie about till they are swept up and carted away.

4683. You anticipate there would be a much more prompt removal?—Much more by putting them into a vessel to carry them to desiccators.

4684. Have you noticed the habit in some of the hanging pens of putting the carcasses in while blood is still dropping from them, so that a good deal of blood goes on the floor, and is mixed with lime and forms a cement on the floor?—No, I have not observed that.

4685. Have you seen the sheep killing places, especially in the further quadrangle that has been before alluded to, where, if you turn up the wooden frame on the floor, you find a lot of filthy matter on the under surface of the frames?—When such has been found, the persons have been warned of it and ordered to cleanse it. Those frames are understood to be regularly cleansed; I cannot say from my own personal knowledge that they are so, but the instructions are to turn up those frames and cleanse the under portion as well as the upper surface of the frames.

4686. Have you examined, yourself, going without warning, a sufficient number of times, to say whether that is done; because when we went, they were very filthy?—I have observed on occasions when I have been there some that were not clean, and have taken a note of it and chid the parties and warned the caretakers.

4687. Do you think the system of inspection of the meat, both at the abattoirs and at the dead meat market, is sufficient?—I cannot say. That is a matter of opinion as to what would be sufficient; but it is the best inspection that exists in the metropolis.

4688. There is practically no inspection at any other abattoirs in the metropolis?—I am not aware that there is, but I know that there is inspection, first of the live stock in the cattle-yards, and there is then a careful inspection of the animals brought down, and that any animals, either living animals in the cattle-yards or after, or if found to be badly diseased in the abattoirs, those animals are not allowed to go into consumption.

4689. Do the City Council propose to make the system of inspection more rigid, or to appoint more qualified inspectors?—I do not know as to that. It has been thought by the City Council that experienced butchers were good judges of the soundness of cattle.

4690. Do you find much trouble through butchers disputing the verdict of your inspector?—No, they accept it without a question. I have no trouble with any of them.

4691. Is that because only very bad animals indeed are condemned, or because the inspector is trusted?—No. Mr. Bennet himself has told me he felt aggrieved with the goodness of a carcass the inspector has taken his knife and scored down.

4692. Passing on to the question of revenue; will you kindly give us such information as you can on that head?—The revenue for the past year was £2,771 3s. 1d.

4693. What does that include; does that include the abattoirs fees or the cattle-yard fees as well?—The abattoir fees only. I may say that the entire revenue from the abattoirs from the time of their opening (they were opened in 1861) down to the present time, was £43,094 12s. 2d.; and the entire expenditure £50,676.

4694. What does that sum of £50,000 odd consist of?—Composed of expenses of building, extending, altering, and repairing the structure, and improvements carried out in the vicinity, and the expenses of management.

4695. What is the price charged per head for slaughtering cattle or sheep?—By a by-law passed in 1860 the scale was, for every ox, cow, heifer, steer, or calf, one shilling; for every sheep or goat, threepence; for every head of swine, one shilling. By a by-law passed in 1862 the rates

E. G. FitzGibbon were fixed at, for every ox, cow, bull, heifer, steer, or calf, threepence; for every sheep or lamb, or goat, one penny; for every head of swine, threepence.

4696. Has there been any subsequent alteration?—Not that I am aware of. I do not recollect any.

4697. Is the revenue of the abattoirs derived entirely from those items?—Yes.

4698. No charges for yarding?—No, not that I am aware of, so far as my knowledge goes.

4699. Has the City Council to pay licences to the Government for killing or is there any other fee?—No; the City Council pays for no such licence.

4700. Can you furnish us also with a statement of the revenue and expenditure in connexion with the cattle-yards?—Yes.

4701. Will you now kindly give the estimates of revenue and expenditure connected with the cattle-yards?—The total revenue from the cattle-yards has been £192,005. That is from the opening of the cattle-yards, in 1857, down to August, 1887. The total receipts of the Corporation from fees for the sale of cattle was £192,005, but this includes an amount which I cannot distinguish, the amount obtained for the sale of cattle within the city (I mean in the inner portion of the city), the horse sale-yards carrying on at Kirk's Bazaar and the other bazaars in Melbourne. They pay fees upon the cattle sold there. And there is another market on the Sydney-road for tame cattle, and it includes the fees for that market also; but the total receipts from 1857 to 1887 have been £192,005.

4702. And last year?—I have not got the exact amount for last year. I think, as far as my memory serves me, that the cattle market was let last year for about £8,000, but I can give you the exact amount if desired. It was, in fact, £10,370, of which about £8,000 would be for the Doutta Galla Market.

4703. With regard, then, to the condition of the noxious trades now situated on the bank of the Saltwater River, opposite the abattoirs, what is your opinion as to their general management?—They are not so satisfactory as I should like them to be; in fact, they are not intended to remain there. They are intended to be removed.

4704. In whom is the land vested where they are situated, on the abattoir side?—In the Corporation of Melbourne.

4705. Is it proposed to remove those noxious trades altogether?—Yes. Whatever is really noxious.

4706. In the immediate future?—Yes; in connexion with the alterations about to be made.

4707. Is it proposed to locate them in some other place, or is the City Council going to give them simple notice of eviction?—There are a number of pigs kept there, and the City Council Health Committee see no reason to keep those there. There can be no difficulty in disposing of waste portions of the animals, without causing offence to the abattoirs.

4708. I understand that all the noxious trades on that bank will be removed. How long have the City Council contemplated that action to remove the noxious trades?—For some time past, since they have been discussing the abattoirs.

4709. Has it had any influence on the noxious trades, making them think it was not worth while to retain their premises?—No. The occupants of those places have been compelled from time to time to make such improvements as were suggested, and they have been always at the risk of immediate removal.

4710. Are you speaking of the noxious trades in the neighbourhood?—There are three places down there. There is one belonging to Mr. Bennet.

4711. In the abattoir grounds, that is?—Yes, one belonging to Mr. Bennet, and almost the only reasonable objection that can be raised to that is not the boiling-down but the keeping of pigs; Mr. Bennet has adopted, at the order of the City Council, air-tight vats. So have each of the others. Then a subsequent improvement was the conducting of an escape pipe into the fireplace.

4712. That has not been done uniformly, however?—It was not done. It was ordered to be done, but it was carried into the flue of the chimney instead. Since that has been observed, that has been remedied, and the pipes conducted into the fire-boxes.

4713. It has been done only in exceptional cases?—But there are only three—Bennet's, Hatton's, and Quinn's.

4714. On whose land, then, is Fitts' place?—I do not know anything about that.

4715. I was forgetting. I was thinking all the noxious trade establishments were all on the abattoir land. You have been referring only to those on the city lands?—Yes; I know nothing about any other.

4716. Coming to those in the abattoirs, is it the intention of the Corporation to remove those?—They intend to prevent the keeping of pigs, and, as at present advised, intend to remove them altogether, to remove the pigs and boiling-down places also, because, although the feeling of the Corporation is that it would be quite possible to conduct the business that has to be conducted there without offence, the existence of offensive trades in the immediate neighbourhood and on the opposite side, or lower down the Saltwater River, causes the nuisances to be attributed to the Corporation and to the abattoirs. It is said that the abattoirs of the Corporation are the cause of those offences—of all those—and it is not so. I have been on the abattoir grounds myself, and have been conscious of the smell which was coming across the river from chimneys and works a considerable distance away, on the opposite side of the river. But the effluvium coming across from those places is all set down to the discredit of the abattoirs; and the City Council, not caring to be subjected to such discredit, are disposed to remove them entirely, and do away with even the suggestion of offence.

4717. Is it proposed to take any action as to the glue and gut and manure factories which are on immediately adjacent land, though not under the direct control of the City Council?—They are not within the municipal limits of the city; the Council have no jurisdiction. We cannot assume functions within another municipal jurisdiction; it would be an offensive thing for the City Council to do.

4718. Is there not power to take action in regard to nuisances out of your municipality, if your municipality is affected?—It would be a difficult thing for us, if we were so disposed, to sustain a case showing that our municipality was so seriously affected as to justify our taking action. The inhabitants of our municipality are only the caretakers of the abattoirs, and injury done to them would be so remote that we could not well sustain such a prosecution.

4719. There is no mode then by which you could secure the removal of other noxious trades that are situated on the banks of the river opposite your own land?—I think the City Council would be railed at for going on a crusade they are not justified in adopting. Some are in the municipality of Flemington and Kensington or of Footscray. I have been there on the river bank and I have found the offensive smells coming across there. I know they were attributed to the abattoirs, and we cannot help ourselves. The only thing is to remove from ourselves the suspicion of offence.

4720. Turning then from those matters, may I ask whether, in your opinion, supposing that the abattoirs are retained on their present position, improved and extended, is it desirable that the system of having stock killed in the country near their natural pastures should also be encouraged, for the Melbourne meat market?—Whatever will secure a better class of food is a thing desirable, and so far as the feeling of the Corporation of Melbourne is concerned, they have not the slightest desire, but that whatever can be an improvement should be carried out; but they look upon it that that is an improvement that should rest with those who can make it pay.

4721. But any procedure of that kind must be in the hands necessarily of private individuals who take up the enterprise?—Entirely in the hands of private individuals who take up the enterprise, and if they can prove that by killing animals near large pastures and bringing the meat down they bring down a better class of food, and that they can command a better price, they would have an inducement to do it. The profit would be the test.

4722. Has the matter been considered as to whether, by municipal assistance, or by Government assistance, a larger dead meat market should be created with chilling rooms?—The City Council have had it under consideration, the question of erecting chilling rooms, but they have not carried it into practical effect; they do intend to erect chilling rooms in one of their market reserves, for meat as well as for other produce brought from the country.

4723. Would not, even apart from the country trade, the system of chill rooms prevent great dislocation of the meat trade by stress of weather, temporary stoppage, and then rushing cattle into the abattoirs and slaughtering, and bringing the meat into the market almost hot in summer time?—I cannot speak with confidence on that. I should think if the meat could be kept at a low temperature it would preserve it.

4724. Apart from the country trade, benefit would arise to the trade and the public from the existence of chilling rooms in which meat could be kept in hot weather?—It is only my opinion. I imagine that chilling rooms would help the butchers to keep their meat in hot weather; but that I cannot speak of with any practical knowledge.

4725. The matter has not been considered in such detail to enable you to say whether the cost of those chilling rooms and their erection would so add to the price of meat as to deter the Corporation or other authority from providing them?—The Corporation had in contemplation, some years ago, when they were extending the meat market at the corner of Victoria-street and Elizabeth-street, the city meat market, the erection of chilling rooms behind those premises, but there appeared to be no great encouragement on the part of the butchers, and no great disposition to occupy them, and therefore the proposition dropped.

4726. Where was that?—The market at the corner of Elizabeth-street and Victoria-street. The proposition was that each butcher should have a chilling room behind his stall, but the butchers at that time did not appear to attach any importance to it, and the proposition dropped. Experience as to the use of chilling rooms, and our acquaintance with them, have increased very much within a comparatively short time.

4727. Just going back to one answer you gave a little while ago, the position seems to me to be this: how could private enterprise compete with the Melbourne markets and the abattoirs while practically, I think, those are subsidized by the Corporation; in other words, you carry on the business, spread over a period of twenty years or so at a loss; now, if a big corporation does that thing, and of course is content to sink a certain amount of revenue year by year in that, could private enterprise fairly be called into play—does it not handicap it?—I do not know that there is any unfairness in it, if private enterprise can discover a method to produce a better article and secure a better price.

4728. It is a question of slaughtering meat and delivering it into the hands of butchers. The Corporation does that at a loss; of course that is from a fund; it is not conducted on commercial principles so to speak?—Then the other aspect presents itself to me that there would be a proposition to increase the price of meat for the purpose of giving private enterprise an opportunity to compete. I do not think the inhabitants of the metropolis would desire to pay higher to enable private enterprise to go into competition.

4729. Indirectly they pay it through their rates?—No, the rates would remain the same.

E. G. FitzGibbon
continued,
28th Aug. 1888.

4730. Still if there is a loss made up by you, that must be paid for by some one?—But the gain is made in the price of the meat.

4731. Is there actually now an annual loss?—No, but taking the whole expenditure on the buildings and management the whole period, there has been more expended for the entire period than the receipts.

4732. Is that not a loss?—In the long run, but it is no present loss.

4733. In other words you have not paid back your capital up to the present moment. You have still a difference of a considerable number of thousands?—The difference between £43,000 and £50,000. But with regard to the question of killing, and with regard to moving the cattle markets and abattoirs, wherever they were moved, supposing they were to be moved, I think it is indisputable that both cattle-yards and abattoirs should go together, and should be in close proximity one with the other; and when you should take them out and imagine that you were going to get them into some isolated place in the country, it must be also remembered that just in proportion to the isolation of the place would be the necessity of having the people employed at that isolated place supplied with the necessaries of life, which immediately means that you commence a township, and that township grows until it has its mayor and corporation, who protest against the so-called abomination, and those abattoirs and cattle-yards must go further afield somewhere else. It is only a shifting of time and position. And it is also a very beautiful and pleasant idea to think of animals being brought benevolently down and turned out into green pastures, there to ruminate and enjoy themselves till misfortune calls them to their last account; but it has to be remembered, as they come down in thousands, that all those green pastures would be trampled out of existence, and that you would have bare spaces around. And wherever you have established a large market it must have communication by railway for speedy transit, and the animals in going down that railway would go through the process of being knocked about the same as they do now, and it would be only a question of degree in any case. If you establish a market north of Melbourne you must also have one south of Melbourne, and probably another east; and when you have done all that, there are the people in the immediate vicinity of Melbourne who will want a market and abattoirs also. From the experience of market matters I have had (and that experience goes back to when I was a child of six or seven years old) I know that there is nothing more difficult to drive than markets. Markets make themselves according to convenience, those engaged in trade find what suits them best, and aggregating for convenience firmly establish markets, and to interfere with them upon merely speculative ideas of doing better savours very much of teaching their own business to people who practically know all about it. That impresses itself very strongly upon me in regard to markets. I remember one market in London which was open when I was a child of six or seven years. It was as beautiful and ingeniously planned a market as human wit and wisdom could then have devised. It was planned to supersede Billingsgate Market, with far better and nicer accommodation. It was to supersede Covent Garden Market, and be an immense improvement on it, and to supersede Newgate and Leadenhall Markets, and other meat markets, by having ample space for the sale of meat. It was opened with great éclat, the letting up of a balloon, eating and drinking, and great glorification; and free occupation of the place was given to tenants for one or two years, I forget which, but long before the expiry of the free occupation the greater portion of it was absolutely empty. It was finally converted, after years, into a toy bazaar; and, last of all, was bought up for the Charing Cross Railway Station, and is now the site of that and of the Charing Cross Hotel, and of the Middlesex end of the railway bridge that there crosses the Thames. That was Hungerford Market. Another experience was the Farringdon Market, in the city, where it was supposed it was only necessary to put up the best market, according to the latest knowledge and wisdom: but that place also was an empty failure, and long since has gone to other occupation. And so with these market matters I repeat that it is a very dangerous thing to meddle with the arrangements which are the outcome of the long experience of men who know what the business is they are engaged in, and what the requirements are. With regard to this cattle market of Melbourne, any alteration made to shift the site of the cattle market miles out of Melbourne would be a matter of loss and serious consideration to people as far away as Queensland, to crowds of people in New South Wales, and to people in South Australia, as well as in Victoria; and whilst the market can be carried on with proper arrangements, and with proper railway facilities given it, as far as the cattle market is concerned, my view is most certainly it is better let alone than being meddled with experimentally. I may say with regard to what I have seen suggested, namely, that the area is not large enough, it is far larger than the cattle market and abattoir site in London. Smithfield Market, in London, was in a position right in the heart of the city, where, of course, it caused very great inconvenience, and was an absolute cause of danger, and more especially because there were no slaughter-houses in connexion with it; but at Newgate Market and elsewhere that was removed, but not out of London practically. It was removed to Islington, and there it is now. I have here a little schedule of reasons which have been put forward by the borough of Flemington and embodied in a petition purporting to show why the cattle-yards should be removed from Melbourne. There are some sixteen reasons; every one of them is answerable with the plainest simplicity; but one of the contentions of Flemington, that the cattle market and abattoirs should be removed is that they are surrounded by a dense population. Why the population of Islington is as large as the entire population of Melbourne and its suburbs, and it surrounds the cattle market at Copenhagen Fields, at Islington; and all their area for the cattle market of London is 30 acres; and there are eight slaughter-houses to carry on the business in what really may be called a central portion of London.

4734. I understand then that, in your opinion, if country killing is to come into vogue, its benefits must first be proved to a certain extent by private enterprise?—That is my opinion. The

market in Melbourne as it exists has been created by private enterprise—has been created for and by the convenience of the people who resort to it, and from the experience of what suits them best; and they protest, so far as I have had any conversation with any of them, strongly that the arrangements, which have come out of their experience, are the very best to suit them and their constituents. If better arrangements can be made by others, by all means let them do it; and if the community gets the benefit, we shall all rejoice.

4735. Would it be possible for you, from the metropolitan abattoirs, as modified in the way you have sketched, to supply the whole metropolitan district of Melbourne?—Yes, I think it quite possible to supply the whole metropolitan district, to provide accommodation and to supply the whole district of Melbourne.

4736. Need great difficulty be experienced in the carriage of meat from the abattoirs to the various portions of the metropolitan district?—No, I do not think so. Considering the condition of the roads as they are now, with the improvements of wood pavement and so forth, I conceive that the transit from the abattoirs, where they are at present situated, to any part of the metropolis will be a matter of ease.

4737. There is one side question I omitted to mention, and that is the question of the disposal of the hides and skins of animals from the abattoirs; is it proposed to modify the present system at all? At present a large proportion of them are brought into town and sold at the warehouses?—They sell the hides and skins as part of the trade of the wool merchants—a sort of offshoot of the exporting trade—the law provides that licences may be issued for noxious trades, and so long as there is no actual offence created, I do not know, that there should be any necessity to interfere with them.

4738. Are you familiar with that trade in skins?—No, I am not. We have had at times complaints, but I have not had any complaints since the law enabling the licensing of noxious trades; because complaints would incur the forfeiture of licence, a consequence that would be troublesome.

4739. In your opinion then, you say that the issuing of such licences has led to improvement?—Yes, it has given a justification for supervision, which, if exercised without such power of licensing, would appear to be an officious thrusting in upon people's business; but the issue of a licence gives a direct authority for seeing that the conditions of that licence are complied with.

4740. I would like to ask the area of the Islington market. Is the population supplied by it greater than the whole population in and around Melbourne?—Greater than the population of the whole of Australia.

4741. I mean the area of the market, in comparison with the Melbourne abattoirs?—It is very much smaller. Taking the cattle-yards and the site of the slaughter-houses together, the size of the cattle-yards and abattoirs for Melbourne is one-third larger.

4742. Is the whole of London supplied from there?—The greater portion. There are other modes of supply in addition, for instance, a place down at Deptford; that supplies a portion of London, but it is very small in comparison with Islington.

4743. Was not the site of the abattoirs chosen on account of its remote position from Melbourne. I understood you to say population was sparse at that time?—That was one of the reasons. The principal reason was the great abundance of room for abattoirs and cattle-yards together, and at a place where there would be no difficulty in travelling the cattle from the yards to the abattoirs, and which was also near to Melbourne, so that there would be no serious difficulty in getting the meat from the abattoirs into the city.

4744. You are aware that, in comparison with the size of the accommodation of the European cities, the accommodation for Melbourne is large?—Very large.

4745. As compared with any city in Europe?—Any I am acquainted with.

4746. If markets were established anywhere else—there are three or four possible stations on the main lines—would there be any loss to the producers?—It would be highly unsatisfactory to the owners of cattle. They would not be sure they were getting so good a price at the one place as they would get at the other.

4747. You think there should be some system for centralization of the sale of cattle?—I think so. There would be a saving of labour, and that tends to keep down the price of meat, which has to be paid by the people of the metropolis.

4748. With reference to the supplying of the suburbs—the southern suburbs—do you think the metropolitan abattoirs would be able to supply, say Brighton, for instance?—That would depend on the mode of carriage, how it was treated. If the whole place was to be supplied, arrangements might be made to carry it by railway.

4749. You think there is no insuperable difficulty?—No.

4750. They would carry the meat in shorter time by rail than it is carried at the present time by road?—Provided railway accommodation is provided.

4751. Is there anything further you would like to state?—No. If there is any further information the Commission desire from me, I shall be only too happy to furnish it. I would just like to say that I saw in a newspaper that a question was put to one of the witnesses, as to whether advantage would arise from independent supervision over the abattoirs and noxious trades. I wish to say, as to the supervision exercised, that the Health Committee of the City Council (which has the supervision of the city abattoirs) encourages the greatest independence on the part of the officers performing those duties, not only the superintendent, but all the people assisting him; and that for the last seven years the Inspector of Nuisances has had orders to visit the abattoirs weekly, as if it were a private place, and to report any faults in the cleanliness; in fact to report upon the whole establishment. He visits the place weekly, and on an uncertain day, so there is

E. G. FitzGibbon
continued,
25th Aug. 1888.

no certainty when he will go, and his report is given in weekly to the Health Committee. He reports upon the state of the abattoirs and yards, and specially and individually upon the state of the three places belonging to Messrs. Bennet, Hatton, and Quinn, and O'Neill's gut factory, and if there is any cause of complaint the people are communicated with, so that attention shall be paid to the matter.

4752. Could you give us the authority that supervises the meat market at Islington?—The Corporation of London.

4753. It has supreme control?—Yes. I would like to add one other word about the size of cattle markets. The largest such market in the world is that of Chicago, there they have some 300 acres of land. In their pens they have some 160 acres. They have an entire municipality, with an army of men to control. They do an immense business in meat, for large canning and tinning places. Notwithstanding that, when it was first established, it was outside of Chicago, it is now wrapped round by the city. When first taken up, it was a reedy swamp, but they have raised it and improved it, and whatever the faults of the killing places may be, in regard to the market, it is as well ordered as a place could be wanted to be.

The witness withdrew.

Thomas Smith sworn and examined.

Thomas Smith,
25th Aug. 1888.

4754. *By the Commission.*—What is your office?—Mayor of South Melbourne.

4755. Have you been long resident in that district?—Some seventeen years.

4756. Are you familiar with the condition of the local abattoirs?—Yes.

4757. Have you visited it recently?—A few days ago.

4758. Do you consider its condition satisfactory?—No, scarcely satisfactory.

4759. What are the defects?—The main defect, as I understand it, is that of drainage.

4760. Is there a sufficient fall in the country round to allow the refuse fluid to pass off quickly?—It does pass off, but not quickly.

4761. Where does it pass to?—The liquid passes into the Yarra, I think.

4762. How conducted to the Yarra?—Through a shoot, as they call it.

4763. What is that shoot made of?—Wood.

4764. Is the ground round that shoot dry, or are pools found round the shoot near the abattoirs?—There are pools now, from the reason that the Harbour Trust not long ago filled the adjoining lands and left the abattoirs in a hole, so to speak; hence the defective drainage.

4765. Those pools come close to the abattoir building?—One of them does.

4766. Is it a fact that blood from the shoot overflows into those lagoons?—No, I do not think that. I found it when I visited the place. That has not been the case when I was there.

4767. Is the water in the lagoons offensive?—I cannot detect offence.

4768. Does it look offensive to the eye?—Sometimes.

4769. In what way?—The colour.

4770. What colour is it?—I have seen it when it was a faintish-green.

4771. That shows stagnancy?—Yes.

4772. That would show that there are stagnant pools near the abattoirs, and you attribute it to the fact that the land has been raised near the river, by the action of the Harbour Trust?—Yes.

4773. Is there any drainage at all of the low-lying ground round the abattoirs?—Yes, there is drainage.

4774. In what way?—Where the shoot that I speak of is, it has been raised to make drainage.

4775. That is from the shoot itself; that just drains the abattoirs?—The shoot partly drains, from part, but not from the whole.

4776. Not the surrounding land?—It could not.

4777. It does not drain the surrounding land, it only drains the abattoirs?—I could not say as to that.

4778. Do you think the condition of the cattle-yard, round the abattoirs, is satisfactory?—I do not.

4779. What are the defects you have noticed?—On account of the deficient drainage the place does not dry; it cannot dry as quickly as it should.

4780. Therefore, the various yards are more or less boggy?—Yes.

4781. Is it possible to keep them clean in wet weather?—Not in wet weather.

4782. Is there any shelter for the cattle at all?—Not in the yards.

4783. Passing into the abattoirs: do you think the condition of the paving is satisfactory?—My experience of those things is so limited that I do not know that my opinion is of value. I may say, as far as my judgment goes, the place is as cleanly as it could be kept.

4784. Is it so pitched that blood and other matters accumulate in the cracks between the pitchers?—It may be so. I am not in a position to contradict that.

4785. You think it is so?—Yes.

4786. Do you think the drainage of the floor would allow the blood and stuff to run off quickly?—Judging of the condition of the place, in my opinion, I think it would.

4787. Have you ever examined the wooden gratings where the sheep are killed; have you turned them up and examined them?—Not closely.

4788. When you have visited those places were your visits expected or not?—Not as far as I knew it.

4788. Is there any provision made at all for the carrying away of the drainage from the places where the manure is at the abattoirs?—I think so. At any rate the manure is only allowed to remain there a very few hours.

4790. In your opinion no nuisance arises from that then?—I am assured the places are cleaned out every day.

4791. Do you think it is wise to retain those abattoirs in their present situation?—In their present situation; the site do you mean?

4792. The present site?—Yes, I think it is a great convenience for South Melbourne.

4793. Do you think abattoirs could be maintained there and not be deleterious to health?—Yes.

4794. Do you think drainage could be provided, sufficient?—By the filling up of the land.

4795. Does your Council propose to take any steps to modify the levels of this land?—Thereby hangs a tale. There have been suggestions made by various Ministers of the Crown. At the time Mr. Tueker was Minister of Lands, the Port Melbourne and South Melbourne Councils interviewed that gentleman and placed the matter of the abattoirs, the state of them, before his notice, and Mr. Tueker, at that time, suggested that a site should be found at Caulfield for the abattoirs, but as soon as that got into print the Caulfield people objected strongly. We then returned to Mr. Tueker, and Oakleigh was suggested, and when that became known the tradesmen and butchers of South Melbourne and Port Melbourne, in meeting assembled, objected strongly on account of the distance. They said it would increase the price of meat to the consumer, besides destroying the shipping trade of Port Melbourne also, by reason of the increase in price.

4796. The proposal being to do away with both abattoirs?—Yes, take them both from us.

4797. Were any other suggestions made of great moment?—The objections were sent to the Councils, and we forwarded them to the Minister. About that time Mr. Dow took the position held by Mr. Tucker, and the matter was at that time continually cropping up—the matter of a large abattoirs—and the Central Board of Health were in communication with us about the alleged nuisance, and we sought an interview with the new Minister, Mr. Dow, and the result was (if my memory serves me) that Mr. Dow intimated to the Central Board of Health that a conference of the local bodies interested should be held to consider the question. The conference was not called by the Central Board of Health, but a communication was forwarded from that body to the mayor for the time being, at South Melbourne, intimating in so many words, that if that gentleman, or any one else interested, chose to attend a meeting of the Central Board of Health to give his opinion upon the matter of the abattoirs, he could do so. Our mayor, at that time, declined to accept such an intimation, knowing that the suggestion had been made by the Minister that a conference should be held; and I believe the Port Melbourne mayor took up the same position.

4798. What is your present suggestion for the supply of the southern districts, including South Melbourne?—We have tried to get another site, or get the Minister to improve that one, or to have one not very far away from us.

4799. Why should the Minister improve your abattoirs?—It is a Crown grant, granted in 1861.

4800. You would like to have that site raised?—We should like to have that site raised—we should be satisfied—or exchange it for another.

4801. Would you be willing to combine with other municipalities. I mean to use the same site; to put the abattoirs together?—We should have no objection to urge to that, as I understand.

4802. I gather that you are not willing yourselves to undertake the improvement of the present site?—We are scarcely in a position.

4803. Having simply a permissive right of occupancy?—I am not quite clear upon that. We simply want to get from the Minister either a *quid pro quo* for the present site or to be put somewhere else.

4804. Do you think that the requirements of your municipality could be met by the extension of the metropolitan abattoirs?—I fancy it would be considered as being too far distant.

4805. Do you think a serious trouble would arise in getting the meat brought from the metropolitan abattoirs to South Melbourne?—It strikes me, in summer, in the hot weather, there would be a difficulty.

4806. Is not a good deal of meat taken from the metropolitan abattoirs to South Melbourne now?—Not much, I am given to understand. Some of the butchers go to the wholesale meat market.

4807. Are you aware that meat from the metropolitan abattoirs is taken eastward as far as Camberwell?—I should not be surprised.

4808. Would you be surprised to know that the price of meat is not higher at Camberwell than in Melbourne?—I should not be surprised, because the Melbourne butchers must get a good price on account of their heavy expenses.

4809. Still you think some trouble in summer might arise if you were entirely dependent on the metropolitan abattoirs?—Yes.

4810. How are the cattle taken over from the cattle-yards to South Melbourne?—Driven over.

4811. At night?—Yes.

4812. Where from? Which way?—I could not say. Along the Yarra bank.

4813. They come from Newmarket?—Yes, I suppose so.

4814. Do you think the majority of the ratepayers of South Melbourne desire to have permanent abattoirs in the Bend, somewhere near where they are now. Have the Council elicited an

Thomas Smith,
continued.
28th Aug. 1888.

opinion on that?—No. They consider they have the opinion of the majority unless they speak to the contrary.

4815. You object to the steps taken by the Central Board of Health. Had there been anything that could be considered complaints from the Central Board of Health, or any other suggestions?—I have not heard complaints recently. I heard that Mr. Taylor, the Board's inspector, was there lately, and said there was nothing to complain of.

4816. Has not the Council received complaints from Mr. Taylor regarding the state of the abattoirs?—I am not in a position to say.

4817. Have complaints been received from residents in the neighbourhood?—Not so far as I know. The lessee told me Mr. Taylor had been. I was not there when he was there.

4818. He says it is so situated that it cannot be kept clean?—I may say the South Melbourne Council could get a much better rent if they could give a fixed lease to the lessee; but they cannot do anything of the kind. We are willing to give the man a week's notice if we can get another place.

4819. You are relying on compensation; you could not expend your funds to purchase a site?—No.

4820. If you get permanent tenure of the site for abattoirs, do you think your Council would be prepared to make a further borough rate, so as to raise funds for the purposes of health, &c., and to improve the place by adopting some of the now known methods of disposing of the refuse, such as Farmer's desiccators, of which you have, no doubt, heard?—If the Council permanently had the site, I know they would adopt those things. With regard to Farmer's desiccators, South Melbourne has been the first Council to move in the matter. We contemplate having one of those machines.

4821. Have you taken steps to get one?—The preliminary steps.

4822. What are they?—The steps?

4823. Yes?—We are ascertaining the cost. We have decided, with other Councils, that one of those machines shall be tried.

4824. In connexion with the abattoirs?—No. But as far as the abattoirs are concerned, I am sure the Council would be prepared to start at once if they had the site.

4825. If they got the site they would be prepared to use Farmer's desiccators?—Yes.

4826. As far as the buildings are concerned, the present buildings would not be sufficient?—We should have to see to that.

4827. Is there any objection to getting meat from the metropolitan abattoirs for those districts; do you know of any?—That is the main objection that I have mentioned.

4828. Increasing the cost to the consumer?—Yes.

4829. Is there any question as to the abattoirs, or the noxious trades, on which you would like to make any statement?—No. I need hardly say that mayors and councillors come and go, but town clerks go on for ever. We can hardly speak on these matters as town clerks can.

The witness withdrew.

Frederick George Miles sworn and examined.

F. G. Miles,
28th Aug. 1888.

4830. *By the Commission.*—You are the town clerk of the City of South Melbourne?—Yes.

4831. How long have you held the office?—Since the 1st of January, 1880.

4832. How long resident in the district?—Since that date.

4833. Are you familiar with the condition of the South Melbourne abattoirs?—I know them from occasional visits.

4834. Do you concur in the statements made by the mayor?—Generally.

4835. Do you desire to supplement or add to his statements?—No, beyond saying that it is not the condition of the abattoirs there is a single objection to, but the surroundings of the buildings that objection can be taken to.

4836. Do you think that either the buildings or the out-buildings, or the site, or drainage, can be looked upon as perfectly satisfactory?—No.

4837. Do you think there can be any radical improvement made there?—No, not on that site.

4838. Do you think if you obtain a good long tenure it would be possible to put properly drained and equipped abattoirs there?—Yes, certainly.

4839. Do you think there would be serious difficulties in supplying the residents of South Melbourne, in the way of meat, from the metropolitan abattoirs?—Until the railway arrangements are a little more perfect I think there would be a difficulty.

4840. What do you mean by "the railway arrangements a little more perfect"?—The meat would be brought in from Newmarket by rail to Spencer-street, and at present there is considerable delay in getting anything across from that station to the Hobson's Bay station.

4841. That is, if the supply was to be by railway, you would require improved service between the two stations?—Yes, the completion of the connexion.

4842. Do you think, in the absence of such railway accommodation, a better mode of transit by road would remove the difficulty?—As far as the supply to the residents of South Melbourne, probably.

4843. That is, it would remove all difficulty, to your district?—As far as the residents are concerned; but the butchers supply the shipping, and they, necessarily, have to have their meat ready, and if they have to go any distance for it they might lose the ships—that is, ships going out.

4844. Could not they do that by the use of steam launches?—It is of the ships going away I speak, or anything of that sort. In hot weather, if the cattle cannot be killed, there may be some delay in getting the meat across from Newmarket to the shipping.

4845. As far as the residents are concerned, you see no reason why they should not be supplied from the metropolitan abattoirs?—So far as I can see.

4846. Do you think there would be any difficulty in getting a combination by the south cities and towns so as to have one abattoirs for the whole southern district?—I do not think there should be; but, as a matter of fact, considerable difficulty has been met. I have the correspondence and minutes here of proceedings of a conference that was held, representing St. Kilda, South Melbourne, and Port Melbourne, with the object of having an abattoirs for the three municipalities.

4847. And what was the result of the conference?—Nil.

4848. What was the real difficulty?—In the first place with regard to site.

4849. Did they all want the abattoirs, or all refuse to have them?—The mayor has explained how it was: that a deputation waited on Mr. Tucker, and this matter came up, and that Mr. Dow afterwards had the matter before him. Caulfield was the first place suggested; and the President of the Central Board of Health was consulted by Mr. Tucker as to a site, and, as I said, at the deputation, Caulfield was suggested as a place where the abattoirs could be erected for the southern municipalities.

4850. And the subsequent history of that negotiation was that given by the mayor?—Yes. A site was selected by Mr. Dow at Fisherman's Bend. When it was reported to the St. Kilda Council they disagreed; they considered the abattoirs at St. Kilda were quite sufficient to meet the requirements of their municipality.

4851. And they withdrew?—Yes, altogether.

4852. With regard to the revenue and expenditure: are the sums large; have you any statements there?—They are let at £150 a year. That could be considerably increased if we could give anything like a lease.

4853. Do you spend anything on the abattoirs?—Just necessary repairs.

4854. What does that amount to per annum?—Comparatively trifling, because, while we hold it this way, we do not think it necessary to expend more money than is absolutely necessary.

4855. Do you think there is any reasonable hope of the South Melbourne and the Port Melbourne municipalities combining and building a good place. Would your Council be willing to do that?—Yes, I think so. Here is a resolution "adopted by conference, consisting of representatives of the Councils of South and Port Melbourne, held on October 17th, 1887, at the Town Hall, South Melbourne. The conference, having inspected plans of abattoirs kindly furnished by authority of the Honorable the Chief Secretary, Councillor Larkin moved, and Councillor Buxton seconded, 'That this conference represent to the Minister that the Councils represented at this conference are prepared to expend a sum not exceeding £10,000 on a suitable building.'—Carried."

4856. Do you think there is any probability of two or more of the southern municipalities agreeing on any site and acquiring it, say, by purchase, and building on it?—I do not see there should be any difficulty about the site selected by Mr. Dow, at Fisherman's Bend.

4857. That is the one objected to by Williamstown?—Yes. And St. Kilda suggested their own abattoirs were sufficient for them, and they stuck to their own.

4858. Is there anything further you would like to state to the Commission?—No. The position of the Council of South Melbourne is, they are not at all anxious to leave the place as it is. That has been said to the Minister of Lands and to Mr. Deakin over and over again; but they are powerless to improve the place while they hold the land with the insecure tenure they have. They are quite willing to move if the Government give them compensation. Here is a letter I sent to the Under Secretary, dated 22nd February last:—"Sir,—Referring to the matter of the South Melbourne abattoirs, I have the honour to inform you, by direction, that the Council of this city has no objection to the abolition of the abattoirs, as its desire is to aid in every way the sanitary improvement of the city, but that it is absolutely necessary that provision should be made for the slaughtering requirements of the city by the Government, and the Council should receive some compensation for the loss of the site and the revenue at present derived from the building, as it is solely in the public interest that the land adjoining has been raised and the present defective condition of the site thereby caused. I have the honour to be, Sir, your most obedient servant, (signed) Fredk. Geo. Miles, Town Clerk."

4859. Did you ask them for compensation on their own site?—No; we did not ask them for compensation on their own site; but we should be losing £150 a year, and the trade of South Melbourne would be, to some extent, injured; so the trade represented to us.

4860. And you think the Government should give you some compensation for that, or give you some other site?—Yes. I may say also that the Council of South Melbourne are now going into the matter of providing another loan, and, out of that loan, providing desiccators for the destruction of town refuse; and abattoir refuse could be then dealt with, if the matter could be satisfactorily settled about the site.

The witness withdrew.

Adjourned to Tuesday next, at half-past Two o'clock.

TUESDAY, 4TH SEPTEMBER, 1888.

Present :

Professor H. B. ALLEN, in the Chair ;

C. Hodgkinson, Esq., C.E.,
W. McCrea, Esq., M.B.,
A. P. Akehurst, Esq.,Hon. James Campbell,
T. M. Girdlestone, Esq., F.R.C.S.,
Professor D. Orme Masson.

Robert Hesleden Binney sworn and examined.

R. H. Binney,
4th Sept. 1888.4861. *By the Commission.*—What is your address?—Myrtlebank, Footsray.

4862. What is your occupation?—Bone miller, manure merchant, and tallow refiner.

4863. You have desired to give evidence before this Commission?—Yes.

4864. Will you kindly make such statement as you desire?—I looked forward more to being asked a series of questions; but I have brought a detailed list of raw material used by us during the years from June, 1886, to August, 1888. We take, annually, about 6,000 tons, and this material consists of butchers' green bones, dry bones, bone meat, fat, refuse beef and mutton, sheep's heads and trotters, and bullocks' heads and feet. Bullocks' and sheep's heads and feet are not used for human consumption here, but are all sent to bone mills. Statement under gives the material that has been delivered to our factory. Green bones we receive from the butchers' shops.

4865. What is "B meat"?—That is the refuse from the vats, which other people have brought, not having mills of their own to grind.

4866. What is super?—The super-phosphate of lime we get from the sugar company.

4867. What is the marl?—We use it in the summer weather, for drying up any refuse liquor lying about the place. That information is taken from our books.—[*Statement put in marked "A."*]

STATEMENT A.—TOTALS.

| Month. | S. Heads. | B. H. & F. | D. Bones. | G. Bones. | B. Meat. | Fat. | Beef. | Mutton. | Super. | Salt Cake. | Marl. | Acid. | Grand total |
|----------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------|-------------|-------------|-------------|-------------|
| 1886. | T. c. q. lb | T. c. q. lb | T. c. q. lb | T. c. q. lb | T. c. q. lb | T. c. q. lb | T. c. q. lb | T. c. q. lb | T. c. q. lb | T. c. q. lb | T. c. q. lb | T. c. q. lb | T. c. q. lb |
| June .. | 149 11 2 0 | 47 5 3 0 | 53 2 2 0 | 61 1 3 0 | 31 3 0 0 | 7 18 0 0 | 1 19 3 0 | .. | .. | 1 14 0 0 | 6 11 2 0 | .. | 360 7 3 0 |
| July .. | 202 13 0 20 | 46 14 2 8 | 40 1 0 0 | 82 5 0 0 | 33 19 1 0 | 6 15 1 0 | 1 1 0 0 | .. | .. | .. | 24 0 0 0 | .. | 437 9 1 0 |
| Aug. .. | 152 3 0 12 | 45 8 2 3 | 33 16 1 0 | 82 4 0 0 | 38 14 3 0 | 3 17 3 0 | 0 3 0 0 0 | .. | .. | 7 19 2 0 | 24 0 0 0 | .. | 391 3 3 15 |
| Sept. .. | 123 8 3 26 | 42 7 0 18 | 21 16 1 0 | 89 13 3 0 | 41 19 0 0 | 4 11 1 0 | 1 9 3 0 0 | 6 2 0 0 | .. | 19 12 1 0 | 82 18 3 0 | .. | 428 3 2 16 |
| Oct. .. | 191 9 1 0 | 45 11 3 0 | 0 33 4 1 0 | 101 9 0 0 | 42 3 1 0 | 5 16 3 0 | 0 2 15 0 0 | .. | .. | .. | .. | .. | 422 15 0 0 |
| Nov. .. | 191 3 3 15 | 42 6 1 5 | 35 13 1 0 | 157 9 2 7 | 41 16 2 0 | 10 2 0 0 | 1 10 0 0 | .. | Glue Refuse. 3 12 2 0 | .. | .. | .. | 483 14 0 0 |
| Dec. .. | 232 5 3 17 | 77 8 1 6 | 47 4 0 0 | 195 8 0 0 | 47 12 0 0 | 2 14 1 0 | 0 2 11 3 0 | 0 15 0 25 | Glue Refuse. 3 12 2 0 | .. | 4 7 0 0 | .. | 610 6 1 23 |
| 1887. | 223 10 0 1 | 48 6 3 4 | 38 7 0 0 | 216 17 1 6 | 50 15 2 0 | 13 14 0 0 | 0 5 3 1 0 | 0 6 0 2 | Glue Refuse. 12 14 1 0 | .. | .. | .. | 609 14 1 16 |
| Jan. .. | 188 0 1 8 | 53 19 0 0 | 0 21 15 0 | 203 12 3 22 | 52 7 2 0 | 19 17 1 0 | 0 9 9 1 0 | 1 3 2 22 | .. | 20 4 2 0 | 45 10 0 0 | .. | 550 4 1 0 |
| Feb. .. | 213 13 3 24 | 30 17 1 0 | 0 33 18 0 | 175 9 1 0 | 47 8 0 0 | 17 7 2 0 | 0 7 3 2 0 | 0 19 3 8 | .. | 12 1 3 0 | .. | .. | 592 11 3 0 |
| Mar. .. | 180 9 2 16 | 61 19 0 0 | 0 41 7 3 | 149 1 1 0 | 35 16 1 0 | 18 10 0 0 | .. | .. | .. | 10 10 2 0 | 66 5 0 0 | .. | 499 6 0 9 |
| Apr. .. | 155 17 0 8 | 61 4 0 1 | 121 1 3 0 | 98 10 0 15 | 37 0 0 0 | 16 10 1 0 | 0 4 7 0 0 | 0 1 12 | .. | .. | .. | .. | 471 16 0 8 |
| May .. | 173 7 3 9 | 52 4 2 4 | 15 14 0 0 | 100 0 1 24 | 42 14 1 0 | 19 13 3 0 | 0 4 0 0 0 | 6 3 0 0 | .. | 1 2 2 0 | .. | .. | 404 6 0 4 |
| June .. | 166 10 0 0 | 0 6 9 0 | 13 10 17 2 | 101 5 3 0 | 8 9 1 0 | 18 15 0 0 | 0 15 2 0 | 0 9 0 0 | Super. 2 11 2 0 | 13 0 0 0 | .. | 9 18 1 9 | 443 3 0 26 |
| July .. | 152 1 2 8 | 35 4 2 9 | 30 4 2 0 | 139 18 0 0 | 33 7 1 0 | 21 17 2 0 | .. | .. | .. | 20 13 3 0 | 24 1 0 0 | 6 14 0 0 | 470 8 0 0 |
| Aug. .. | 162 16 2 4 | 38 6 2 23 | 17 4 0 0 | 134 1 0 0 | 54 8 2 0 | 22 7 0 24 | 0 6 0 0 | .. | .. | 6 0 0 0 | 22 12 2 0 | 3 0 0 0 | 476 10 2 20 |
| Sept. .. | 157 0 5 0 | 35 16 2 20 | 6 10 0 0 | 176 10 0 0 | 47 11 2 0 | 20 1 0 0 | 1 8 2 0 | .. | .. | 5 13 0 0 | 25 11 0 0 | 4 11 2 16 | 517 16 3 18 |
| Oct. .. | 185 4 1 3 | 56 13 1 21 | 7 13 1 0 | 179 3 1 0 | 30 16 2 0 | 21 19 2 6 | .. | 0 10 2 0 | .. | 15 3 2 0 | 13 0 0 0 | 5 0 3 19 | 643 15 2 18 |
| Nov. .. | 173 2 1 4 | 70 9 3 27 | 11 1 1 0 | 254 5 2 0 | 39 12 2 0 | 26 16 2 24 | 0 3 0 0 | .. | .. | .. | .. | .. | 611 17 1 21 |
| Dec. .. | 198 8 2 25 | 66 7 0 7 | 13 5 1 0 | 246 1 0 0 | 37 15 2 0 | 27 9 2 1 | 0 15 2 0 | .. | .. | 21 2 1 0 | .. | 4 12 2 16 | 597 11 0 7 |
| 1888. | 181 16 3 18 | 73 10 2 15 | 14 16 3 13 | 240 17 2 0 | 35 10 1 0 | 28 11 1 10 | .. | 7 12 1 0 | 10 2 2 14 | .. | .. | .. | 564 7 2 21 |
| Jan. .. | 194 0 3 27 | 58 19 3 18 | 5 7 2 0 | 209 10 3 22 | 32 12 0 0 | 23 4 3 10 | 0 10 0 0 | 5 1 0 0 | 4 18 1 0 | 4 13 0 0 | .. | .. | 493 18 2 2 |
| Feb. .. | 182 14 0 0 | 59 13 3 24 | 6 3 2 0 | 183 15 3 0 | 24 6 2 0 | 22 3 1 6 | 0 11 2 0 | 2 5 0 0 | Paste. 7 2 1 0 | 14 9 3 0 | .. | 2 5 3 18 | 569 16 1 19 |
| Mar. .. | 210 3 2 11 | 91 14 0 27 | 19 9 3 0 | 162 14 1 0 | 38 11 2 0 | 23 5 1 19 | .. | .. | 3 6 1 0 | 10 19 2 0 | 7 10 0 0 | 4 1 1 8 | 490 2 0 5 |
| Apr. .. | 194 16 3 19 | 72 10 2 16 | 9 5 2 0 | 138 5 0 0 | 37 12 0 0 | 20 14 3 18 | .. | .. | 4 10 3 0 | .. | .. | .. | 404 10 2 2 |
| May .. | 185 4 2 26 | 58 12 0 3 | 24 18 3 0 | 116 18 3 23 | 16 6 1 0 | 17 19 0 6 | .. | .. | 7 3 2 0 | .. | .. | .. | 394 16 0 23 |
| June .. | 168 4 0 12 | 57 16 1 8 | 9 16 3 0 | 116 3 2 0 | 16 7 0 0 | 19 5 0 3 | .. | .. | .. | .. | .. | .. | .. |

4868. Will you just state the sources from which you get those different materials?—Sheep's heads and trotters. The sheep are killed at the various abattoirs, and the skins are sold to the fellmongers; the heads and trotters are parts cut from skins, and we receive them from the fellmongers direct. The bullocks' heads and feet we receive straight from the abattoirs. Dry bones we receive from the middle men and dealers that keep marine stores in Melbourne. Green bones we receive direct from the butchers, that is when they have cut the meat off for the purpose of their customers, and the bones are left behind; and we send our carts daily to each butcher, according to the amount of trade he does—some have one hundredweight, some two or three; it depends upon the amount of meat consumed at the time, and a great deal depends on the weather. The supply is very intermittent. Some days we receive six or seven tons, whereas with a sudden change of weather turning to a thunderstorm, we may receive close on 50 or 60 tons. It is very difficult to tell in the morning what we are going to receive by night time. A thunderstorm coming on will often deteriorate all the meat in Melbourne, so that it makes it difficult for us to cope with; we have to work all the day and night to keep the material down at all. The next item is bone meat, that is where smaller factories have purchased these green bones and matter; they themselves have not mills to crush it, and they sell it to us, and we dry it and grind it up. The fat is just the fat cut trimmed off the meat, in various shops. "Beef," that comes to the same as green bones. "Super" is entirely inoffensive, it is received from the Sugarworks. "Salt cake," that is the refuse from the chemical works after manufacturing sulphuric and nitric acids. We crush it in a mill to powder and deodorize with it. The "marl" we use for absorbing the moisture about the place on the floors, or any material that is too greasy we mix a little of that with it. "Sulphuric acid" we use for making super-phosphate.

4869. Do you think the mode of forwarding raw materials to you could be improved?—I do not think so. Of course, there have been a variety of suggestions about covered-in carts; but all our carts have to be constructed as light as possible, consistent with the weight to be carried. They have to back up lanes and back-yards, often under great difficulties. Boxed-in carts would not only be inconvenient, but would not carry any quantity. Covering the material with good canvass covers I think meets the case, the cart to have good high sides. An ordinary cart which will carry 30 to 35 cwt., if boxed-in, would not carry more than 15 to 20 cwt.

4870. Suppose a very bad consignment of stinking bones of meat has to come to you, how could it best be transferred without causing nuisance?—We do not often have a large consignment; I do not recollect one. In that way, a very large butcher might have a little more than usual go bad; but 5 cwt. or 6 cwt. they look upon as a very large amount. The butcher has paid for the material to sell as meat, and he watches it closely. I do not think we have received more than 5 cwt. or 6 cwt. from any one butcher.

4871. Suppose you had up to 5 cwt., how best could that come to you without offence for your own purposes?—It only happens a few days in the year that anything like that does occur, not more than four or five days, because the butchers watch it; and when it does happen the quicker the material is got away the better. We cannot expect it. Sometimes of a morning we think to ourselves we are going to receive a great quantity during the day, and made preparation to receive and deal with it, but the wind has changed with a thunderstorm, and, to our astonishment, we get very little; the butchers, being suspicious of the weather changing, have taken little stock in; and on other occasions they get caught, and then we have very large quantities.

4872. When the raw material comes to you, what do you do?—Put it straight into the vats from the trucks. I do not suppose any material stays more than ten minutes to half-an-hour on the place, that is barring accidents.

4873. Are the blow-off pipes put under the furnace?—They are put under the furnace; the way we do it—[*the witness explained his meaning by a diagram*].—This is our vat, and this is another vat we have outside. We run the pipe underneath from this vat into this one here right on the top, from the bottom of the first vat to the top of the second. Here is our boiler. The only means for the fumes to get out is right from the top, right under here.

4874. Under the boilers of the furnace?—Yes.

4875. After digesting is complete, do you wait at all before blowing off?—No; we go straight at it; we turn on the escape valve and it goes away through the furnace up the stack.

4876. Have you any separate arrangement for dealing with waste steam and inoffensive vapours?—No; it all goes under the furnace.

4877. When the waste matter is taken from the vats, how do you dry it?—We depend on itself to a large extent, and to the air passing over it.

4878. On what kind of floor do you put it?—A Kauri floor. We have some down in the yard that we place on asphalte, but as a rule it is Kauri.

4879. Do you think some better arrangement could be made for that?—I have tried a great many arrangements. I tried a kiln one time, and found the water of it was so greasy it would not dry it, the grease seemed to get more diffused through it. It is not so much water as grease. The only means that ever I found is a current of air passing through it. Another time, I tried a floor specially constructed with steam-pipes under it. I found that the same as the kiln.

4880. Would it not be better with an asphalte floor and a current of air blown over it with a fan?—The quantities are so great, it would be difficult to get a current to operate; and a grating would be better, on a cement floor, to allow the current to go underneath and over it.

4881. Could not that be arranged?—It might be, but I would not answer for it doing.

4882. I mean a large fan?—We have such quantities, it becomes a question whether it would do quick enough for our purpose.

4883. It would be an exhaust fan?—It might be exhausted, but I should think the best plan would be to drive the air in. It would be much the same whichever you did. I have been myself of opinion, for a long time, that that would do better, and what we have very often been compelled to do is a great mistake, viz., being hermetically sealed; and for this reason, that I think it allows the natural heat of the whole place to cause fermentation.

4884. The principle source of annoyance in connexion with your trade comes from this process of drying?—Yes, I think so.

4885. Could you suggest any better way of hastening this process on by having the waste matter spread thinly over a grating with a current of air artificially maintained under it?—I could not, because that has always been my own idea; but then you see the authorities over us have been opposed to it somewhat. Now, down at my place, I have always found myself that the material we have out in the open sheds was a great deal less offensive than that inside the factory; that is, the sheds were open, where the air was continually allowed to pass.

4886. You are clearly of opinion, however, that any use of warmth for drying is not of service?—I am of that opinion. Of course, dry air might be better, but I do not think hot air would.

4887. While we were visiting your establishment, we noticed some refuse in the sheds on an earthen floor, is not that objectionable?—It is an asphalte floor; all our floors are asphalted down-stairs. You may have thought it was earthen, from the fact that the ground has been raised outside since it was constructed. It is an asphalte floor, and is in pretty good order too.

4888. Do you think any arrangements could be come to whereby the quantity of stuff left about could be lessened?—It is simply a question of demand for it. Some years, I have known such a demand for bone manure that the difficulty has been to keep any stock in the place at all.

R. H. Binney,
continued,
4th Sept. 1888.

Now, last month there was an unusually heavy trade. We sent out 520 tons. The month previously we sent out 175, the month previous to that 345; it entirely depends on the demand. This year has not been over good for local demand; in the main this is owing to so many farmers round Melbourne selling out to land syndicates.

4889. Where does that mostly go to?—Amongst the farming community; and a great deal goes to Tasmania, and some to Mauritius, and some to Auckland.

4890. It is used mostly for high cultivation?—No; nearly every farmer round Melbourne uses bone dust; they get no crop at all unless they use it.

4891. For gardens?—No, for hay growing; many of the farmers will buy 10 and 20 tons a year off us.

4892. What do you do with the waste liquors?—I evaporate a considerable quantity when we make super-phosphate, otherwise it goes into the river.

4893. Do you use the liquors with the manure?—Only what I evaporate. I do it in a vacuum-pan. I use the stack of the boiler for the purpose of drawing the air out.

4894. Did you find much offence arise in connexion with the condenser?—No, because nothing came out, it was all drawn out. Our stack is 100 and odd feet high, and I have never been up there to know what it was like. I should not think there would be any, because that liquid, when it is fresh, is no more than beef-tea in smell, and it passes through the furnace and flues of boiler about 70 feet to reach the stack, all the time subjected to fire.

4895. And a little kitchen fat?—We are careful not to allow the fat to get in; we have to protect our own interests too at the same time.

4896. What fluids pass from your works into the river?—Simply the gelatine from the vats, and it does not amount to much. There is no solid matter whatever in it, no residuum if you let it stand, nothing will settle on the bottom. I gave to our agricultural chemist a sample to test at the time they wanted me to put a settling-pan to let it settle for sediment, to prevent any residuum going into the river. I stated at the time it was wrong, that we had no sediment to settle, that in the course of time a certain amount of phosphate of lime would come to the top of it, and consequently the settling-pan would be no use; and, if it went promptly into the river, people would not notice it.

4897. Could you not precipitate it?—I believe you can precipitate gelatine with tannic acid, but I do not think it would be profitable. Super-phosphate of lime will precipitate it; but I do not think there is anything injurious in it. In all the drains round us you will find them clean, and the river round us is as clean as nearly Studley Park. You cannot lay any charge to us about the river.

4898. Speaking generally, you think your difficulty has arisen out of your being required to keep the air of your establishment in, instead of freely ventilating the whole place?—I would not like to say that altogether, but I think it would have been better to have allowed us to have it well open. These smells are most offensive when the weather is very sultry, or even a drizzly rain; but you might come down to my place and live opposite our works, as I do myself, and, for two or three months, you never smell anything, and then only with an easterly wind, which is of rare occurrence. People staying with me from Tasmania, New Zealand, and other parts ask where the smells are; they have heard of them. There is always a certain amount of offence in the direct line of the wind.

4899. Would not the presence of a fan be of great use to you in that close sultry weather?—Yes, I should think so; it would keep the air always on the move inside.

4900. And dissipate anything objectionable?—Yes; but I do not think that by any means we can keep the entire smell down by it.

4901. Could you adopt some system of ventilating your place such as the Messrs. Kitchen have in their place, with a fan and a tube to lead the air under the furnace?—My place is so large. Kitchen and Sons have only one part offensive; mine is more or less offensive from beginning to end. Every stage of it is offensive. The bones when received are offensive, and even the manufactured article, the bone dust, is offensive.

4902. That is merely ammoniacal?—It is all ammoniacal through the place.

4903. The smell of the cooling stuff, is not that peculiarly offensive?—It is a soapy sort of smell; but I think it is more ammoniacal than anything else, with, of course, the nitrogenous gases.

4904. Could not that particularly offensive part be conducted in a special place with a fan to take the air under the furnace?—One of the greatest facilities we require to keep down smell is the rapid drying of material. If we could take it out of the vats when there is no great smell and put it into a drying machine or kiln and dry it straight off, we could get rid of a great deal of the smell; the rest would be that which is natural to bone dust.

4905. Is there anything further?—There is one thing you were asking, whether it was possible not to keep such large quantities of the material on hand. One thing that has acted a bit against us is this: When the Act came into force that these factories were to be licensed, paying £5 a year, it likewise involved the stores keeping manures for sale. The result was, that many storekeepers who kept a couple of tons of bone dust on hand for trade were compelled to stop it; after paying the license-fee, it left no profit. If it was removed and made a nominal sum, it would cause a larger amount of stuff to be kept around for the convenience of small gardeners, who have to come to Melbourne. That would keep 200 or 300 tons spread about every year.

4906. Spread the smells through the community?—It was a great convenience to gardeners, and the storekeeper could easily keep a couple of tons under command without trouble to anyone.

4907. How would it work if, instead of a fixed regulation fee of £5 being imposed, the local boards of each district had the discretion to fix the amount of the registration-fee within certain limits?—I do not know that that would do. The result might be that a great many of them, to

stop factories starting, might put the maximum on it. I prefer to be directly under the Government at any time.

4908. The local board have, under the Act, the power to fix the regulation fee of dairies not to exceed £1, and a great majority fixed a formal fee of 1s. ?—I should think, in the case of dealers and storekeepers who have kept manure on hand, it would be just for them to go to the local board, and they have the power to fix it; because it is hard, when a man takes 20 tons of bone dust a year, out of which he makes £10, £5 of that has to go to the licence-fee.

4909. There would be a kind of latitude in that way; the particular requirements of any district could be met by the local board of the district ?—Yes. There is another thing. There are very often a great many reports about factories and noxious trades, which are extremely exaggerated. Not long ago, a statement was made, at Footscray, that some men working at a job there had to vomit up their meals. As a matter of fact, the men at that particular job used to boil their billies at our furnace fire; and men at the Harbour Trust works all cook at our fire, and are doing so to-day. Very often a lot of exaggerated statements are made with the object of influencing the removal of works. Often those statements are extremely exaggerated.

4910. Do you remember the manufactory got up by the Macmeikans on the Saltwater River, some years ago ?—I just remember it.

4911. They used sulphuric acid there ?—I could not answer anything about that.

4912. I do not think it paid, but it controlled the smell ?—I could not say about that; I was too young. With my present experience I do not think it possible to conduct a noxious trade without some amount of offence, though it may be mitigated.

4913. On that point, do you use any sulphate of soda for fixing your ammonia ?—Yes.

4914. Do you think that by adding the sulphate of soda — ?—We do use it very largely under the name of salt-cake.

4915. Is there anything further you would like to say to the Commission ?—Only to mention that the Commission visited us the other day without notice, and it might be as well if you were to make an appointment with me some other day. There are things I might be better able to explain.

4916. Suppose you were removed, would it make any difference ?—It would; the further you cart the material the greater the cost of carting to the farmers, because we are in a central position for them all round.

4917. Do you get much from the odds and ends of butchers, or mostly in a wholesale way ?—Both ways. We have, I think, altogether attached to us close on 20 carts.

4918. Suppose you were some distance out, would it in any way raise the price of the material ?—Yes, it would make a great difference in the cost of cartage; the further you have to go, the greater the expense would be.

4919. What is the value of the material you turn out ?—Our retail price to farmers is £6 to £6 10s. a ton for bone dust.

4920. How much do you turn out ?—About from 3,000 to 3,500 tons manure a year, and upwards of 1,000 tons tallow, we also turn out oil largely as well, about 12,000 gallons.

4921. Do you think that the cost of your product would be seriously increased if your factory were placed, say, at Braybrook, on a railway siding ?—There will have to be, under any circumstances, a depôt in the city; and then, of course, the siding would have to be taken right into the factory, right over the vats, so that there would be no trouble handling.

4922. Would the cost of the production in that case be seriously increased ?—I would not be prepared to answer that at present.

4923. The mere fact of your being alongside the water is no particular object; it does not cheapen the material ?—No; in fact, I do not think our business requires any drainage, because, if we were on a large tract of country, 100 acres, I believe all our drainage could be utilized for manure on the grounds; I have always been of that opinion.

The witness withdrew.

Samuel Knight Grimes sworn and examined.

4924. *By the Commission.*—What is your address ?—Moreland-road, Brunswick.

4925. What is your occupation ?—Bacon curer.

4926. Can you give the Commission an idea of the extent of your business ?—The extent of ground I occupy is nearly eight acres, and the approximate value, at present, is about £800 an acre; that is owing to the increase in the price of land. The buildings are composed of brick, stone, and wood; and I value them at £2,000. That is including the dwelling-house. As to the machinery and plant, I have a large freezing machine and other sausage machines and engine for working the business. The value of those I reckon about £1,800; the freezing machine cost £1,000.

4927. What is the nature of that ?—We use cold air, one of Robertson Brothers' make; and we use it for cooling the pigs in summer-time. It is on the same principle as the Haslam machines, only not so large. There are no chemicals used with it; nothing but the cold water and air. The annual output is close on £18,000 a year, slightly increasing. That is giving a rough approximate estimate.

4928. Will you describe the yards and pens in which you keep those pigs ?—The pens are pitched with brick. First of all, they are concrete underneath, then there is a thin layer of cement put on top of the concrete to make it thoroughly smooth; the bricks are laid on the cement, and grouted in with cement, so that they are perfectly watertight. The drainage goes from those pens

R. H. Binney,
continued,
4th Sept., 1883.

S. K. Grimes,
4th Sept., 1883.

S. K. Grimes,
continued,
4th Sept. 1885.

into catch-pits, and in the catch-pits we use some charcoal and use plenty of lime; and we find the water goes away from those catch-pits without any sediment. It is syphoned from one pit to the other, and there is nothing but pure water going away.

4929. Have you a sufficient fall on the brick surface to let all fluid run off quickly?—Yes, abundance, something like 15 feet of fall to the main drain.

4930. How many pigs do you have in a pen?—About fifty to sixty.

4931. How are the pens enclosed?—Brick and cement wall, covered with an iron roof, with abundance of ventilation; with the roofs louvred, and from the floor to the top of the roof is about 25 feet.

4932. Then how are the drafting-yards arranged?—We use one narrow lane to open the pen into, a long lane, and draft them from there into the killing pen by just putting down one door on one side. The doors are constructed to form a clear passage right through.

4933. How are the drafting-yards drained?—The same as the pig pens, through into pits; their drainage must go into pits. The cold killing-pen is floored with pitchers, bricks may allow a man to slip. We kill calves, and the bricks would not be so suitable; the calves would slip about on them. They are grouted in with cement, so that nothing goes through the pitchers.

4934. Have you a concrete floor on which the pitchers are laid?—The pitchers are on the earth below—old brickbats and lime, breaking-down stuff from alterations. The pitchers are 9 inches, and there is a foot depth of cement through them.

4935. Do you find much trouble with the grouting coming out?—None whatever.

4936. Do you use a hose for washing?—Yes.

4937. Do not you find the water do damage?—Not if it is thoroughly done at first. There is no fear of the cement coming out.

4938. Where the grouting is washed away, it is owing to bad work or being used too newly?—Yes.

4939. Then the drainage from the killing-yard?—The blood is all collected, and carried into a large iron boiler that is built in outside; that is emptied, generally, after the killing is done. Of course, we do not get one-tenth the blood from a pig that you do from a bullock. One 20-gallon boiler will hold all the blood from 70 or 80 pigs.

4940. What do you do with the blood?—It is buried in my own ground.

4941. How do you do that?—Put it down 2 feet to 2 feet 6 deep, and then spread lime over it, and then put the earth over.

4942. You are raising the ground then?—We fill up in rotation. That only takes a space of about 3 feet by 18 inches by 2 feet deep; and then there is very little blood, it does not fill up the hole. We allow plenty of lime, so that nothing can wash out; the amount of blood coming from a pig is so small that it takes very little lime up.

4943. What do you do with the offal?—We burn it. I have abolished boiling down since May twelve months; and I certainly think if you saw the process of burning you would say it is the simplest and easiest and best way of getting rid of it. We have a Cornish boiler, with a large furnace to it, and we burn the offal as it comes from the pigs, or next day. Sometimes we count it all up one day, and it goes right into the furnace. I might tell you that the weight of the offal from a pig, that we have to burn at the present time, amounts to seven or eight pounds; that includes the pluck and the inside. Of course, in England, the whole of that is consumed for food, and brings a large profit to bacon curers. Here it is perfectly useless; we cannot sell it, and I find that, reckoning the expense of keeping steam going and the low price of tallow, that I have benefited in the saving of fuel in burning the offal, besides not having any nuisance in the place. We live on the place, with my family, and we do not like stink more than anyone else; and since I have burned the stuff there is no nuisance about the place, and no complaints from anyone. It is not only the boiling down that is the trouble, it is what is left from that—what we call the soup; and your offal has to be left for, perhaps, two or three days before it is boiled down. The nuisance when the steam commences to generate in the boiling-down vat is something fearful. And I find it pays me better to burn the offal; it is a saving of fuel, and less labour, and every way better.

4944. How high is your stack?—Forty-five feet from the surface; a brick stack. Owing to the strike, I have had to use coke, and I find we can utilize it better with coke than we could with engine-coal. It gives better results, and there is a fiercer heat, and no smell.

4945. Do the vapours pass straight from the stack?—Yes, the same as the brick kilns. We often, I may say, get the smell of boiling down from Footscray way. People say I must be boiling down, when I have not a fire on the premises; I have brought parties into the factory and shown them there was no boiling down.

4946. How far are you from Footscray?—About two to two miles and a half as the crow flies. We are just on the turn of the Moonee Ponds Creek.

4947. How are your hanging-rooms constructed?—One side is brick and the other is wood, lattice work, or battened up one side so that we can get the whole of the wind to come through; brick floor. The drying-rooms upstairs are just on the second story.

4948. Is the bleeding thoroughly complete before the carcasses are taken into the hanging-room?—Yes; they have to be thoroughly cleaned and washed before they go there; and they remain a whole night there, till the next day, when they go in the freezing-room.

4949. What temperature do you get them down to in the freezing-room?—We can bring them to pretty nearly anything. We generally come down to 34° and 36°.

4950. You do not actually freeze?—No; it would not do us to freeze.

4951. You find bringing it to 34° or 36° that the meat is injured?—No; the meat takes the salt quicker than it does lower. If we were to freeze, we should probably have the inside of the

carcass stinking while the outside would be cured with the salt, similar to what you see in the old country. You will see a pig frozen in the centre of the back, and then it gets tainted.

4952. Where is the fluid drainage from your premises put?—It goes into the creek, at the bottom, which carries the drainage mostly from a large portion of Coburg, that goes through my own property, and that passes into the Moonee Ponds Creek. To show that the fluid from the place is harmless, the cattle down below drink it. They do not know there is anything there.

4953. In your opinion, is it wise to allow pigs to be kept at the ordinary abattoirs?—Certainly not.

4954. Why?—In the first place, the bacon curers have suffered very great disadvantages from the same thing. I think you would find the trade oppose that. They would make it penal for any pigs to be fed at the slaughter-houses, or fed on the offal. It is one of the greatest curses we have; and, besides, the pigs are sent to us as farm-fed, and we get an article that you cannot make good bacon of; it has not a good colour, and will not keep as well as good farm-fed. There is not a buyer in Melbourne who would buy slaughter-house pigs if they knew it. There is usually a large ball of hair accumulates in the stomach, and we only find that out after we kill them.

4955. You cannot tell that in buying?—No; they are got up in such a manner, and they clean them in such a way, that unless you absolutely knew where they come from, you cannot tell them. In fact, often the nicest-looking pigs are sold as farmers' pigs, and they have come from the slaughter-house. I should like to see an Act passed that pigs should be prohibited from being kept at any slaughter-house.

4956. Can you tell them by the taste?—Yes, an expert could. I am sorry to say that the farmers do not take the interest in feeding pigs that they should.

4957. Are the slaughter-house fed pigs unhealthy?—They cannot be as good as pigs fed on grain and milk and that. The bacon will not keep. If you salt down a piece of slaughter-house pork, you find it turns rancid and yellow.

4958. Is there any objection to feeding the pigs on blood?—I should think so.

4959. Is there really?—I could not say what action it might have on the pigs. All I know is this, that if you get a pig, in slaughtering that has eaten any blood, you will find the stomach and intestines are all covered with blood and stuff, and it remains that way for days. That is my experience in opening the pigs.

4960. Even where blood is mixed with meal; you are aware that pigs are fed on that?—No, it is the first time I ever heard of that. I may say that I have spoken to the trade in reference to this, about keeping pigs at the slaughter-yards, and had the expression from nearly every one in the business in Melbourne, and they are all completely against it, because those reports go forward to the public, and they say—"We do not know where this has come from," and it stops the consumption and does injury to the business.

4261. You think there should be an absolute prohibition of keeping pigs at a slaughter-house?—Yes, I do, as a bacon curer.

4962. Apart from people's likings, have you any good evidence for saying that the slaughter-house fed pork is unhealthy and inferior?—I could not say it is unhealthy, but I can say it is in every respect inferior to corn-fed pork.

4963. In your opinion, need a business such as yours be the cause of any nuisance?—Not the slightest, if properly conducted. The only offence that could not be prevented occasionally is if the pigs get quarrelling among themselves and make a noise. In fact, in the business where I served my apprenticeship, everything was carried on in the main street at the back premises, and the pigs were driven through the front premises and slaughtered at the back.

4964. Where was that?—Bristol.

4965. Do I understand that the offal is burned before it begins to decompose?—It is burned within twelve or thirteen hours, because, if we start up steam in the morning, as the killing goes on the offal is thrown in. In winter we do not kill so late, and the next morning the balance is thrown in. In the summer-time we have the freezing machine going and the offal is put in and away about ten o'clock. We would not like to keep it two or three days in the summer.

4966. You always burn it fresh?—Yes.

4967. Is there any offensive smell from the chimney?—None whatever. You could not find there was anything offensive, more than if they were burning sawdust.

4968. Not even at some distance?—No.

4969. Have you any further statement to make?—I should like to say something about disinfectants; we find that lime is the cheapest and best thing for the drains, and no trouble about it. I have been asked about it, and I find the whitewash-brush and the lime-bucket is the best thing you can use for a slaughtering-place. As far as killing pigs at the abattoirs, too, for bacon-curing purposes, it would be impossible for us to carry on our business if we were compelled to slaughter our pigs at the abattoirs. Sometimes we do not kill more than two or three days a week, and we must have the place free from smells; because the pork will receive a smell from the drains or anything lying about, and it will not cure then. There is nothing that will take the surrounding smells much quicker than pork; and if we had to go to the abattoirs, where we were crowded for room, and could not carry on our business by ourselves, we should have to give up the business. There has been some talk that all the killing and slaughtering should be concentrated. If that was so, I would decline to go, and would give up the business; and that is the general opinion of the trade as well. It is quite a distinct business from the ordinary slaughtering, and we have to keep our premises exceptionally clean, otherwise we should soon feel it in our pockets. I know, for instance, where nightsoil has been buried alongside a bacon curer, it was a loss of hundreds of pounds to him, so we have to be doubly careful; and as regards our offal, the amount is so small that it does not trouble us in the least.

S. K. Grimes,
continued,
4th Sept. 1888.

4970. You have plenty of land to bury in?—We have nothing to bury now. I could have brought some of the clinkers from the boiler, and you could have seen there was nothing in them.

4971. Is there any ash?—Nothing whatever. It all goes, nothing but the clinkers and the furnace. I have held a licence in the district for seventeen years, in Brunswick, and about three years in Coburg, and have never had a single complaint against my premises; and it has always been held up as being carried on properly and thoroughly, and I should be very sorry to forfeit my good name, I can assure you.

The witness withdrew.

John Pritchard sworn and examined.

John Pritchard,
4th Sept. 1888.

4972. *By the Commission.*—What is your address?—Smith-street, Fitzroy.

4973. What is your occupation?—Butcher.

4974. Wholesale?—Both wholesale and retail, and also slaughterman and grazier.

4975. In your opinion, is there sufficient accommodation at the Metropolitan Abattoirs for the butchering business?—No.

4976. In what particular department is the lack of accommodation most felt?—All over it; the places are not large enough, they are not wide enough; there is not sufficient room to kill the cattle, nor for hanging either. I myself applied to the City Abattoirs, some time ago, for convenience to kill sheep; and I got a letter from the inspector saying that he had no room.

4977. In your opinion, is the site suitable for killing operations?—No.

4978. Do you think it could be made suitable?—It may be very much altered, so as to give people proper accommodation to kill, and get proper drainage. I could not say much about the drainage, because I have not seen it right down to the Saltwater River; but I think it could be improved.

4979. Would complete reconstruction be required to put the abattoirs upon a proper footing?—Yes, with a different construction altogether; in fact, to begin with, those abattoirs are about 15 feet wide, you want it at least 18 feet wide for the hanging-room, and for carrying the beef in and out; 3 or 4 feet wider each way, and 10 feet longer.

4980. Are you referring to the killing places?—The whole place altogether; they ought to be constructed like a street; the one side to be sheep slaughter-houses, and the other bullock slaughter-houses. I should think about a 40 feet building, and about 2 feet each bullock; 40 feet would hang 20 bullocks comfortably, and if one man wants to hang up 40 bullocks he could take two places; I should think that would be better than having that one building sent back, because it would throw the building out of shape.

4981. In your opinion, is there sufficient room in the accommodation paddocks at the abattoirs for the stock slaughtered there?—Yes, I think so.

4982. In your opinion, are those accommodation paddocks suitable for the purpose?—Not suitable, the ground is too low.

4983. Could that ground be altered so as to make it suitable?—I do not know whether there is sufficient ground to raise it; I do not think there is, in the neighbourhood.

4984. In your opinion, if earth were to be obtained, it would have to come from some other place?—Yes; if earth were to be obtained, of course, they could improve it, and it would be a very suitable place.

4985. Do you think the stock suffer much in those abattoir paddocks?—Yes.

4986. In what way?—In summer and winter both, by having no drainage, and being up to their knees in mud.

4987. Is it a fact that they are often that way?—It is a fact.

4988. Is it a fact, that it is only in one particular place, where there is a depression of ground, that the water lies?—The paddocks there are much of a muchness; it is very flat country; there may be some places a little drier than the others.

4989. But still, speaking generally, you say it is a common thing for stock to be up to their knees in mud?—That is, perhaps, going too far—half-way up.

4990. Do they deteriorate?—They must, standing that way in winter.

4991. In value?—Yes, they fall away in condition.

4992. How long are stock kept there?—From Wednesday till the following Wednesday or Saturday, from two to ten days.

4993. Is it more common for them to be kept a full week or less common?—Some are always kept a week; suppose you kill 20 cattle, you would, perhaps, on Thursday or Friday, have to buy for the following week; and some of them are always kept to the following week, and some nine or ten days.

4994. Do you think any large proportion of cattle are killed within 24 hours of sale?—Not a great proportion; they do not commence the following day, so as to let them settle down a little.

4995. In your opinion, nearly all the cattle have 24 hours' quiet after sale?—A great part of them.

4996. Some have not?—No; some are killed the same night.

4997. Do you think that half the cattle are killed on the second day after sale?—No.

4998. A much smaller proportion?—About one-third would be killed on the second day.

4999. The rest at varying periods during the week?—Yes, perhaps one-third is too much to say; but somewhere about that.

5000. You state it is a fact, that cattle decidedly lose in condition if kept there for a week ?
—Yes.

5001. Why, then, are they kept for a week ?—Because it does not suit the butcher to kill them before he wants them to put them in the shop.

5002. Does the delay improve the meat, or is it simply a matter of convenience ?—If you buy the beasts on Wednesday, you cannot kill them till you want to use them.

5003. Is the meat of the animals killed at the end of the week better than that of those killed at the beginning of it ?—I think the meat is better killed about Saturday; but after Monday I do not think there is any improvement, because the beasts begin to fall away, it loses the sap, and the meat eats dry.

5004. In your opinion, then, there is not any perceptible improvement in the meat after keeping for three days ?—After the following Monday, from Wednesday, you might say four days.

5005. Do you think it would be a great convenience in the trade to have a siding, not only at Newmarket, but right by the cattle-yards ?—Very great.

5006. You say the meat does not improve after the following Monday ?—No.

5007. Does it improve up to that time ?—Yes, it does, because the first day or two they get fiery and a nasty colour with running about; it improves by cooling down, but after the four days, the beast begins to fall away.

5008. Do you find it possible to adequately feed the stock during those four days ?—Yes.

5009. Do they eat ?—They will not eat much the first two or three days.

5010. Why ?—I suppose, because they are off their run, and do not feel settled down in those yards.

5011. They are put on dry food, that may be one reason ?—Yes, till they really hungered down to it they will not eat it.

5012. They are hungry after being driven in trucks ?—They will not settle down to hay till they are very much driven to it; some cattle will; it depends on whether they are quiet or not; some will eat it at once, and some will sulk.

5013. Is the system of inspection at the abattoirs satisfactory, in your opinion ?—I think so.

5014. In your opinion, is there any necessity, from the stand-point of the trade, for having private abattoirs in the different suburbs of Melbourne ?—I think it is very beneficial for the trade, and for the public at large.

5015. Is it not a fact that the stock are killed at those abattoirs without any inspection ?—There is an inspector appointed there,

5016. For suburban abattoirs ?—They get the general health inspector in those places.

5017. As a matter of fact, is there any real system of inspection at all ?—Yes; there is Mr. Taylor; that is his duty, I think, to walk round those places.

5018. Is there any officer who, at suburban abattoirs, really inspects the different carcasses ?—No, there is only a borough inspector; but he does not inspect all slaughter-houses. Mr. Taylor, of the Board of Health, is privileged to go round those places at all times.

5019. Is it not a fact that a large number of bad cattle are taken from the sale-yards to the suburban abattoirs, so as to avoid inspection at the central abattoirs ?—I do not think anything of the sort was ever done; I do not know of any case.

5020. Have you sufficient knowledge to say it is not so ?—I have every reason to believe that such is the case; I have never seen anything of the sort going to those abattoirs; and I feel perfectly justified, on my oath, to say that such things are not done. I believe, as a rule, the best meat is killed in those suburban abattoirs, whatever I have seen; there is nothing but the best meat goes there, because the people, such as of St. Kilda and Richmond and Sandridge and all around those places, buy their cattle at the cattle-yards, and I am sure they buy the best of meat, and they are driven there to kill. I see all those people buy the best cattle for those places.

5021. If the suburban abattoirs were abolished, what difficulties would present themselves ?—I think it is a terrible thing to kill cattle at the City Abattoirs and to drag them in lorries in the dust to Brighton and Richmond, and sheep also. I do not see how you are going to get on with the sheep; it would be a great inconvenience, and the meat would not be in as good condition; and a person near to the place, in the summer-time, can have what he wants killed in the afternoon, and it would be much more convenient to him, and he would get it in early in the morning; but if he has to drag it home, he has to be at work night and day to get it. I think it is a very great convenience for the public and the butchers to be allowed the suburban abattoirs, as long as they are kept clean.

5022. You spoke about lorries and carts; is it your opinion that the carriage of meat on lorries and open carts should be allowed ?—You are bound to carry beef on lorries, and sheep-trucks for sheep, so that you can cover them up easily with cloths; you can see them along the Fleming-ton-road.

5023. Why not have prepared covered carts ?—You must have then the lattice to keep them cool, and the dust would come in just as if you had nothing; you cannot keep them boxed up for that distance; you must have air for carting meat, whether in the railway or a lorry or whatever it is, because if you put meat into a well-aired carriage from Echuca in the evening, you can bring it as well from there as from the Melbourne abattoirs in a lorry, in fact, better, because the draughts will cool the meat better.

5024. If the suburban abattoirs are retained, should inspectors be appointed ?—I think so.

5025. Could one inspector visit all the suburban abattoirs satisfactorily ?—I think so.

5026. Would it be possible to meet the requirements of the south side of the Yarra by one abattoir instead of several ?—That might do.

John Pritchard,
continued,
4th Sept. 1888.

5027. Instead of a multitude of them?—If you had one at the back end of St. Kilda, that would serve St. Kilda and Brighton. I think there should be two required there, one would be better than nothing, but two would be much better; and that would spread the thing abroad, for it is the greatest mistake to get everything in one lump; you can do away with the offal and refuse much better.

5028. Do you think two would be sufficient for the south side?—Yes, I think so.

5029. Do not you think that, with proper railway conveniences, many of the difficulties you have stated would disappear, having a siding at the abattoirs and running the meat out by train to the outlying parts?—Then you must have sheds at the different places, and the butchers would have to cart it from there; sheds at South Yarra and St. Kilda and Brighton, and then people's meat would get mixed up, and it would be a great inconvenience to the trade. Perhaps the meat would not come by train when you went to meet it, and the butchers all want their meat by six o'clock in the morning in summer, and once on the train it would have to be carted again; it would involve a second handling, which would be objectionable.

5030. What is your opinion as to the proposal to have a large quantity of the stock for the Melbourne meat-trade killed in the country districts?—It would alter the thing about; if the stock were killed in the country, would you do away with the abattoirs?

5031. No; admitting that the abattoirs must be retained for an emergency supply?—I should fancy, if you have an abattoir for that, you can never beat Laverton, and run it down to town. I do not know any better place around Melbourne.

5032. What is your opinion of the proposition made to establish abattoirs at Wodonga, for the cattle coming across the Murray at Albury, and another, say, in the Echuca district, for the cattle coming down from Deniliquin, and another at Sale or Warragul, for the Gippsland cattle—do you think that some such system could be worked, and better meat obtained?—If there were a proper place, and a proper market to land it in; but if bringing it from Echuca and Wodonga, you have to have refrigerating cars. I do not see how you can manage it. You would have to have chilling-rooms and keep them close, because if you open the door for five minutes it will run down eight or nine degrees.

5033. What is your conclusion?—Warragul; that is the cool side.

5034. Confine your attention, say, to Wodonga—what is your opinion as to the results that could be obtained if a killing-place were established at Wodonga for the North-Eastern districts, and for stock coming across at Albury; could such a system be worked well and to advantage, at a reasonable cost?—I do not think so.

5035. Why?—Because I think the cost of killing and the cost of storage and shifting when it got here would be more expensive than the present mode.

5036. It would add to the price of the meat?—Yes.

5037. What do you think about the condition of the meat killed in the country?—The condition would certainly be better. It would not get bruised as much as it does now; but if they came across in trucks from Sydney, or wherever they came from, they would be liable to be bruised in reaching the country abattoirs.

5038. But, as a matter of fact, are the losses very serious at present from injuries to cattle?—They are.

5039. What proportion on the way down from the Murray are seriously injured?—I should think, perhaps—upon my word I could not say, but I should say, as near as I could, two or three die out of every hundred; they get down, and the others trample on them.

5040. And how many severely bruised approximately?—Over five per cent.

5041. If that amount of injury could be got rid of, by having an up-country abattoir, would not that be a very material saving?—They would be just as liable to that injury in coming across in the train from New South Wales or Queensland as from down here.

5042. Still, you would have taken away the injury between the Murray and Melbourne?—Yes.

5043. Would there not be a considerable saving in that?—Yes.

5044. Would not that saving, to a certain extent, compensate for the increased cost of providing markets and refrigerating places?—No. I think they can turn the offal to better effect here, such as skins, the tanning of hides, and the cost of tallow; the bringing the tallow down again would be very injurious.

5045. You think so many charges would be added in that way that the price of meat would be raised?—I do not think there would be any saving that way.

5046. Do you know anything about the American meat trade?—No.

5047. Have you had any experience in dead-meat railway traffic?—No, only from Sandhurst round about here. I know that in London (I was there last year) I saw their chief cattle market is right in the heart of the city. It is a meat market. The cattle are both alive and dead, and there is an abattoir closer to the market than ours is, and some, if they think proper, take the bullocks to the market and slaughter them right in the heart of the place, and others drive them to their back doors and kill them on their premises.

5048. Is it a fact that a large proportion for London comes in a dead state?—A wonderful quantity.

5049. How does that meat compare with the meat of the animals killed in London?—I could not tell. I did not watch closely. There was a splendid lot of meat in the market.

5050. Do you know what distance the meat travels to London?—From all parts of England and Scotland, I think.

5051. If that can be done in England, a dead-meat trade competing with a live meat-trade, why could not it be done here?—It can be done here; but I think the expense would be quite as much bringing it down dead as alive, and you want a thorough place to receive the meat when you get here. Say there was a market at Echuca for wholesale slaughtering and buyers. Say, for instance, I am a buyer of cattle round Echuca; I have got my butchers to serve in Melbourne; then the consequence is I should know pretty well what they would want for every day's killing, and in the hot weather they would send a telegram saying so many bullocks and so many sheep for "A." and "B.," and I would put my men on the work directly, and instead of putting them in the hanging-room at the abattoirs, I would put them on the hanging-bars into the truck at once, and send it right on at night, and the cattle would look quite as well as in the slaughter-house; in fact, they would come in better condition than a lorry load of beef would come from the abattoirs, or a truck load in the dusty weather.

5052. Then why should not this be done?—That is not for me to say, if you think proper to do it. I feel confident it will be done eventually by private enterprise.

5053. Do you think any serious trouble would arise in connexion with the sale of cattle and sheep—would difficulty arise in respect to the stock sales if several abattoirs were established up country?—It would, because it would drive the trade into two or three people's hands—into the wholesale butchers' and into the stock and station people's hands, because a man with ten or fifteen bullocks it would not pay him to go to Echuca to buy them and have them killed; he would simply buy his meat, as a person in the trade does, in the meat market.

5054. The general butchers would buy in the dead-meat market in Melbourne?—Yes, they would have to.

5055. Would any evil arise from that?—No.

5056. Would it not enable butchers to know more accurately what they were buying?—No.

5057. At present a man buys a pen of cattle or sheep, and has to judge what the meat will be like—suppose he saw the carcasses already in the market, would he not know better?—If a man knows his business, he ought to know the live sheep as well as the dead.

5058. Speaking generally, you do not think evil would arise from the establishment of a dead-meat trade instead of a live?—No. I think in time it will work itself; but, for the present time, I do not think you can do anything better than the abattoirs and the cattle-yards, and the suburban ones.

5059. Have you had any experience of meat coming down from Sandhurst?—Yes.

5060. Under what circumstances is it sent down?—Suppose meat is very scarce in Melbourne. The fact of the matter is, I have not had much experience in Sandhurst meat for 25 to 30 years. When the roads were very bad I bought some 60 to 80 beasts at Sandhurst at a time, and had them killed there, and sent down. It was when they were sending beef from Sydney.

5061. You have not had any lately?—No; it would not do now. This was in the winter time.

5062. The handling of the meat in that old rail service was very rough?—Yes, very.

5063. And a great deal of injury done; more than necessary?—Yes; the carcasses were put down on straw in the station. You must keep the meat hung up.

The witness withdrew.

Francis William Donovan sworn and examined.

5064. *By the Commission.*—What is your address?—High-street, Preston.

5065. What is your occupation?—Currier.

5066. You appear to-day as the representative of the Amalgamated Tanners' and Curriers' Union of Victoria?—Yes.

5067. To give evidence, I believe, as to the reasons for which your trade should be removed from the rest of the noxious trades?—Yes. Some short time ago—about two months ago—we waited upon the Chief Secretary, with a view to urge upon him the reasonableness of excluding our trade from the noxious trade list in the Amended Health Act of 1883. Mr. Deakin listened very attentively to the arguments that we adduced, and informed us that this matter, with a number of others, had been relegated to the Sanitary Commission, and assured us that if we submitted the same evidence that we did to him that he had not the slightest doubt but what our request would be acceded to; and, in compliance with his request, I am here to-day to give some of the reasons that we adduced to him on the previous occasion. In the first place, we contend that it is the first time that our trade has been designated a noxious trade in the history of the world. Our trade is a very ancient one, and you can well understand the feelings aroused in those that have followed the trade to find it in company or associated with trades that are generally admitted all over the world as requiring special legislation to regulate in the interest of sanitation. But there is a consensus of medical and scientific testimony that our trade possesses exceptional advantages by way of promoting sanitation. It is only necessary to refer to the time of the Plague of London, and other serious epidemics that history furnishes us with; the fact that those that were engaged in our calling were perfectly exempt from the effects of the disease, and so highly estimated was our trade amongst those that suffered that it was a frequent occurrence for a number that were afflicted to be brought within close proximity of the trade that they might always enjoy the same immunity. This is a fact that is not disputed. We find that the Health Act of 1883, in which our trade is designated a noxious trade, and all the provisions of that Health Act, operate in a way that militates seriously against the operatives as well as those who engage in it. Our trade is peculiarly circumstanced. By way of explaining, I would point out that the material

John Pritchard,
continued,
4th Sept. 1888.

F. W. Donovan,
4th Sept. 1888.

F. W. Donovan,
continued,
4th Sept. 1888.

required for conducting a tannery comes at certain times of the year, and some of our employers speculate while the market is favorable, and to do so it is necessary sometimes to make temporary provision with a view to secure the commodity that they operate on, such as bark, which requires the extension of temporary buildings. To do that, by the Health Act, you have to advertise two months in the paper circulating in the district before you can make the necessary additions with a view to store your materials. By the time you have complied with the provisions of the Act, the opportunity of selling the line of bark has gone, and consequently the employer suffers in proportion. In a great many instances, on account of the favorable way it was carried on in the early days of the colony, getting bark in great profusion and hides very cheap, gave the trade exceptional facilities. Consequently, the trade is now surrounded by a very large population, and in fact in some places has propagated a number of those industries, and you will easily understand that amongst a mixed population that there are a number of them whose taste is somewhat fastidious; and knowing that this Act of 1883, by applying some of its provisions—namely, that ten persons within a radius of half-a-mile can be instrumental in getting the registration of a tannery stopped—has a very surprising influence upon the employer, and consequently he does not feel inclined to invest his capital. That is left to the caprice of any individual to work up, and those provisions of this Health Bill operate against us seriously. Two or three instances have come under the notice of the Union, where employers have expressed their regret that, on account of certain raids by speculators and others, they have been deterred from expanding their business, on account of the provisions of this Act.

5068. Can you give direct evidence to that effect?—Yes. Mr. McLean, of McLean Bros., Northcote Tannery, stated to their employes that they would expand their business to a considerable degree if it were not for the fact that capitalist land syndicates have informed them that if they attempted to enlarge their premises they would take steps to get them closed altogether.

5069. What is the precise provision in the Act that you refer to?—Part V. Nuisances; Clause 91—"Any person who, after the passing of this Act, establishes or newly carries on within the district of a local board without their consent in writing any of the undermentioned trades businesses or occupations (that is to say)—Works for the boiling down of meat, bones, blood, or offal, bone-mills or bone manure depôts, manure works, fellmongeries, tanneries or wool-scouring establishments, glue factories, marine stores, piggeries, soap or candle works or factories, sugar works, fish-curing establishments, places for the storing drying or preserving of bones, hides, hoofs, or skins, or any other noxious or offensive trade business or manufacture, or who without such consent adds to or extends any buildings or premises used for the purpose of such trade business or manufacture shall be guilty of an offence against this Act, and shall on conviction thereof be liable to a penalty not exceeding fifty pounds in respect of the establishment or extension thereof, and shall also be liable to a penalty not exceeding five pounds nor less than forty shillings for every day during which such trade business or manufacture is carried on, whether there has or has not been any conviction in respect of the establishment or extension thereof. Provided that no such consent to the establishment or carrying on of any such trade business or occupation shall be given or have any force or authority if contrary to the provisions of Part IV. of *The Public Health Statute* 1865. Provided further, that prior to the granting of any such consent notice of intention to apply for the same shall be given by advertisement one month previously in two of the newspapers circulating in the district, and that if any person, whether a resident in the district of such local board or not, object to the establishment of such business he may state such his objection to the local board; and if nevertheless the local board decide to grant such permission, he may appeal to the Central Board, whose decision shall be final, and if against the granting of such permission shall prevent or annul the same." The other provisions you are conversant with. They are equally stringent. But we desire to point out that if our trade, in the opinion of this Sanitary Commission, requires regulating, that the provisions of the Health Act of 1883 are not applicable to our trade; that each trade requires different regulations. For instance, the report of the Chief Inspector of Factories for the year ending 31st December, 1887, in his annual report says, in clause 22 :—"If a man employing four persons besides himself." He is referring to one man engaged in this business. We are hampered by this, that a man has to consult three or four of those Acts before he can proceed with the extension of his business. He says—"If a man employing four persons besides himself should, through an increase of work, desire to take on an extra hand, it would be necessary before doing so to forward plans and particulars of his premises to the local board of health. In nine cases out of ten, a place of this kind could not be passed on account of the stringent regulations made by the Central Board, and the occupier would either be forced to refuse the chance of additional work, or, as is done so often, give the work out, and so defeat the objects of the Act. Certainly not 5 per cent. of this class of employers would register their places unless discovered by the inspectors, and made to comply as far as possible." So I think that is a very important difference. There is another phase about this Act especially applying to our trade. We find, on reference to the licensed victuallers' trade, the liquor traffic, that they made special arrangements for compensation; now there is no arrangement made in that Act of 1883 in the event of the licence not being granted to the employer to carry on his business. He can be closed abruptly with ten persons signing a petition, and so on. His business can be closed and no provision to compensate him. This we think is decidedly unfair. If one trade, in the opinion of the Legislature, should receive compensation on account of their means of living being taken from them, we think the same liberality should be bestowed on our calling; but of course there is an amount of scientific data that could be supplied as to our calling that I feel sure would impress you as to the necessity of the fairness of having our trade altogether taken out of the provisions of this Act. Of course, it is not necessary to anticipate what the objects of the framers of the Bill were, but I think that a consensus of testimony against it is

forthcoming, and is easily obtained. I know in the Shire of Preston, where they draw, I think, something like £70 from the fees collected for noxious fees, and the state of their treasury is not very good, from the correspondence I have had with them they have given their consent that they would co-operate in any way with us to get our trade removed from the noxious list. So unfair did they think it for us to be associated with those trades, and they have men there that discharge their duties very efficiently, that they have given the written consent of the council to have it excised. There is just another phase; there are something like 7,000 operatives depending on the leather industry, and the State to a great degree encourages the manufacture of leather by its tariff, and to my mind it seems absurd for the State to do that on the one hand, and then to initiate legislation that affects it in such a manner as the Health Act of 1883. Of course, I presume that the gentleman constituting the Commission have the evidence concerning those engaged in special callings, the rate of mortality, and so on. From evidence that has been submitted and furnished by different sources, it is proved conclusively that the mortality in the tanning trade compares favorably with any other trade; in fact, those engaged in it are supposed to be much more healthy, and frequently what is supposed to be a nuisance, the refuse of the tan, is, at the recommendation of medical men, ordered to be laid in front of invalids' doors when the persons are just on the verge of making their quietus from this world. The tan is spread before them, I suppose, for some effect, not to expedite their departure.

5069A. You have spoken of threats held out occasionally as to closing tanneries—do you know of any instance since the Act of 1883 came in force of a tannery closed under those circumstances?—No, but I have known of instances where an attempt has been made to close it, where they have attempted to get the ten signatures, but there was so great indignation that they could not get them.

5070. Then the Act does not have any effect on them?—But the fact of those provisions being there has a surprising effect upon our employers.

5071. As a matter of fact, you do not know any instance in which any such attempt has been successful?—Not successful, but it has been tried just recently. Of course, you are aware that, owing to the land "boom," the land adjacent to the tanneries has undergone a considerable change, and the owners of the land, to make it as attractive as possible, desire to have everything that they think is unsightly or detracts from the value of their properties removed, and they have their own ingenious methods of pulling the string. Out in the Preston locality that has attracted the land syndicates, and numbers of those syndicates I know to my own knowledge have attempted to get those places removed.

5072. I have not heard of any instance where they have been successful; it is very easy to talk about things?—It has a very surprising influence on those engaged in the trade.

5073. Is there any further statement you desire to make?—No. There are some phases I have omitted.

5074. Is there any part of tanning that is attended with noxious smells or offence?—The principal ingredient in tanning is lime and the extract of wattle bark. The lime, I think you all know, is curative, and the tan liquor is, by its chemical properties, specially curative, and there is nothing noxious about it; in fact, the aroma from a good liquor extract of bark cannot be excelled in my opinion. I have seen very fastidious persons come in there to the tan-yard, and where they have been able to get the aroma direct from the bark they have expressed themselves amazed at what a delicious perfume it is.

5075. I asked if there was any part of the process of tanning attended with noxious smells?—There may be noxious smells to a person not engaged in the work; an outsider may consider it noxious, but they have not proved noxious to those engaged in it.

5076. But in the process of tanning there are noxious smells emanating—What about the bate?—There are various bates used. It all depends on the tub. Just recently, a gentleman in Adelaide has discovered a bate, I forget the exact name, but I believe its properties are very inoffensive. Our trade is a trade that science can be applied to in a variety of ways; in fact, in France, it has engaged the attention of some of the greatest scientists of the day, and this new bate has been pronounced better than anything in use before, and the old bates, such as the liquid got from immersing fowl dung, will be a thing of the past. That is unsavoury to any one coming in the place, but the effect is counteracted by being treated with lime. When the refuse is discharged from the tannery it is not offensive.

5077. Are not heaps of this fowl dung offensive?—We can only get a bag of it at a time.

5078. Is that process patented in Adelaide in use in any town in or about Melbourne?—I believe it is in use in Michaelis, Hallenstein's, at Footscray. I believe it is in use at several places.

5079. Do you know any place where it is in use, where, from your own inspection you can say it does away with the noxious smells?—No. There is another bate, an American bate, which supersedes the fowl dung, and that does away with the effluvia from the common fowl dung.

5080. Is it now the case that fowl dung is being used in tanneries in Melbourne as a bate?—It is in those that confine themselves to dressing goods.

5081. Is it a fact that fleshings are in some tanneries kept to dry, with a view to make them into glue, now?—No, only the pieces of hide. The fleshings are sold to different persons that can utilize them by some other process.

5082. Are they kept to dry in some tanneries in Melbourne?—Not to my knowledge.

5083. Do you know they are not?—I have not seen fleshings.

5084. Is your knowledge of the tanneries of Melbourne sufficient to enable you to say they do not put them in the open air to dry?—As president of the organization, I have opportunities of knowing and seeing in the big yards. I would know of it.

F. W. Donovan,
continued,
4th Sept. 1888.

5085. Is it with the small ones those things occur. As a matter of fact, we saw those the other day—fleshings drying in a yard?—That has not come under my observation.

5086. Do you think that nuisance would arise if spent water from tan pits were run off without the lime pit being run off at the same time?—The spent water—the tan itself—is not a nuisance. The water and soap that they immerse the hides in first may be, but if that is let off with a quantity of lime any noxious fumes would be counteracted, I think, by the lime.

5087. But it would be objectionable to let it go itself without lime?—Yes, most decidedly.

5088. Is the fact that some of the smaller tanneries about Melbourne are very dirty in the ordinary sense of dirtiness?—I do not admit that they are dirty. I admit that, to a person not conversant with the trade, in premises that have been erected some considerable time and had got discoloured by the peculiar nature of the trade, appearances might be against us.

5089. I am speaking about ordinary dirt. Is not it the fact that several of the smaller factories near Melbourne are extremely dirty?—I do not know of any.

5090. If you visit some of the smaller ones I think you will see why the tanneries were included in the noxious list?—I have followed your reports as to your Commission pretty closely, and could explain a good deal, and you dropped on those places without any notice, and it is possible to come on another day when they were cleaning up when they would present a different appearance. You caught those people on the hop; but I assure you on a Saturday, when they clear up, they would have presented a totally different appearance altogether. The neighbours and fastidious persons say they do not experience any nuisance from those places. So, in that case, it seems hard for the outside element to complain about it. Those living on the spot should be the best judges.

5091. Every member of the Commission knows from personal observation that a tannery can be, and that the large ones are, conducted without any offence, but the point is how do you recommend as to the keeping of the small tanneries in good order, if tanneries be removed from the list of noxious trades?—The small tanneries now, by the provisions of this Bill, are generally driven to places not at all adapted for carrying on the business. They attempt to get to a place where the drainage is very bad, to evade the responsibilities of this Act, and give as little offence as possible, so the site is not adapted to the carrying on of the business, and liquids that should be immediately discharged from the place are allowed to congregate and be a nuisance; but you might apply the same to any kitchen yard where the drainage is defective, places where the people are slovenly in the kitchen, their places are disgusting, but still is not fair to say every yard is a nuisance. The ordinary provision of inspectors of nuisances, we think, should be ample to make those people keep those places clean.

5092. You think the powers now vested in the inspectors of nuisances should be sufficient to keep all tanneries without nuisance, small or large?—Yes.

The witness withdrew.

Benjamin Holton sworn and examined.

B. Holton,
4th Sept. 1888.

5093. *By the Commission.*—What is your occupation?—Carrier.

5094. You are the representative of the Amalgamated Curriers' and Tanners' Association?—Yes. I would like to point out in the beginning that my connexion with the trade extends a considerable time in this colony, and also a much longer period in the old country, and for the information of the gentlemen present I would like to point out that all the tanneries I have been acquainted with in England were carried on in the very centre of the population, without any nuisance to the surrounding neighbours. What I want to convey is that tanneries can be carried on, and are carried on, very efficiently, to the satisfaction of all concerned. During my own life time I have known Asiatic cholera to visit the town where I was born. As an instance of the healthiness, and the desirability of having tanneries in the midst of population, I would like to point to a fact that came under my notice in that very town. There was a large bone-mill manure works established close to the tannery. It was a large tannery, and the only distance between the two was an ordinary 50 feet street. A cargo of bones was brought from a European port in the Mediterranean, and unfortunately brought germs of that dreadful disease, Asiatic cholera. During the discharge of the cargo the men engaged in carrying the bones to the mill soon showed signs of the disease, and began to sicken and die very rapidly, and the houses they lived in were just at the rear of this bone-mill, and it was quite expected those who were engaged in this tannery would suffer, but, strange to say, they were left entirely alone by this disease; not a single individual was ever touched, and the doctors and scientific men recommended the people who got scared by this visitation to seek the permission of the proprietors of this tannery to visit it during the operations that were carried on in it during the morning and evening, when the different pits were being changed in the tannery. Hundreds of those visitors were allowed to promenade round the yards, and the result of the visit of this plague was that the bone-mill was ordered to be closed by the Town Council, and the streets of the town saturated with lime, a thing used very plentifully in tanneries, and then the disease abated and disappeared. They never thought for a moment of closing that tannery.

5095. Everybody acknowledges that a tannery can be conducted without nuisance. The question is how are the public to be protected against the annoyance as well as the possible injury by badly-managed tanneries?—I desire to corroborate the evidence of the former witness, that under the provisions of the Act the nuisance inspectors have all power, and can make the small tanneries just as healthy as any other trade. In our opinion, the nuisance inspectors can do what is sought to be done by this very peculiar Act of 1883; and as it is admitted that the large tanneries are properly carried on, so can the small ones be carried on in a like manner, and with that

admitted, our efforts are very much lightened, and we rely on that phase of the question that the nuisance inspectors can do all that is required to make the small tanneries as healthy as the others, and remove all offence.

E. Holton,
continued,
4th Sept. 1888.

5096. What is the reason they do not do it if they have the power—if you argue that the nuisance inspectors have sufficient power?—Of course, it is for the nuisance inspectors to carry out their duties properly.

5097. What you think would be a sufficient remedy appears to fail now?—If the nuisance inspectors did apply the remedies, and then failed, we could understand it, but there have been so very few prosecutions by the nuisance inspectors that we take it they are either lax in their duties or that some other influence is at work; of course, those of the operatives who are in small tanneries cared for the visits of the inspectors of nuisances just as much as they would in their own back yards; we desire to be healthy, and do not desire to endanger the lives of any of our neighbours or ourselves by any remissness on our part, but we do believe that it was a mistake. We only desire to point out, under the provisions of the Factories Act, that the nuisance inspectors can do all that is necessary.

5098. Is there anything further you would like to state?—There is nothing to my mind, but I shall be happy to answer any questions.

5099. The matter is a simple one?—It is quite simple in my opinion, and has been all through.

The witness withdrew.

Squire Kennon sworn and examined.

5100. *By the Commission.*—What is your address?—River-street, Richmond.

Squire Kennon,
4th Sept. 1888.

5101. What is your occupation?—Tanning.

5102.—Do you concur in the remarks made by the two preceding witnesses?—Yes, I do, in all the remarks made by the previous speakers; and I would like to add one or two things in order to explain more fully what they stated. I may mention in the matter of bate, that there is a composition now in the market that has been introduced during the last year or two, and I do not see why all the tanners should not use it. We have been using it during the whole of the summer, and we find it very effective; it is not in the slightest degree offensive, and it does all the work, and, in fact, I think does it better than that composed of fowl's dung or such material, and is as cheap if not cheaper.

5103. What is it composed of?—I cannot say, but we get it in packets of 4 lbs. for 14s., and 1 lb. will do 100 hides.

5104. What other matter do you desire to refer to?—I would also like to speak in connexion with the Health Act of 1883. Now, I am an employer, and I was surprised when the Sanitary Commission came down to our place the other day to find with respect to a new store which we had built that we were liable, owing to having built that store, to a fine of £50; I think it was Mr. Le Capelain who told me we were liable to a fine of £50, and I hunted up the Act and found it was correct. We built the store unaware of this, and if we had known of the Act we would have probably hesitated about erecting the store; therefore, I think it would have a tendency with us to prevent us extending our premises and spending capital in the extension of our business.

5105. Has any application for permission to extend a tanner's business ever been refused, to your knowledge?—I know, with regard to new tanneries, it has.

5106. Permission has been refused to them?—Yes.

5107. You know that yourself?—Yes.

5108. What was the reason assigned?—That it was in the midst of population, and a petition was got up by the surrounding neighbours—just a few persons are required, ten, I think, according to the Act, and these would be successful in having the place stopped at its very inception. I would also point out that as Government encourage us by the tariff and otherwise, and as we are liberally treated by them, no restriction should be placed on the business.

5109. Further than the control of the inspector of nuisances?—I think he could manage the whole affair quite well enough. I may state, according to the Factories Act, the sanitary clauses there are quite sufficient for all purposes.

5110. Then those are not enforced?—They are with us.

5111. Do you desire to add anything further?—No; I think not. It would be very hard upon us that we should be placed under great restriction through the neglect of the few. You mentioned an instance of two or three tanneries being very neglectful in the sanitary arrangements of their premises. I should think, as to those, that it would be very hard for the large majority of tanners, who, as you admit, keep their places very clean, that they should be subject to restriction through the sanitary neglect of those few.

The witness withdrew.

Thomas Dunn sworn and examined.

5112. *By the Commission.*—What is your address?—57 Oxford-street, Collingwood.

Thomas Dunn,
4th Sept. 1888.

5113. What are you?—A tanner.

5114. You are the Secretary of the Amalgamated Tanners' and Curriers' Union of Victoria?—Yes.

5115. Do you concur in the evidence given by the other members in the trade present?—Yes, fully.

Thomas Dunn
continued,
4th Sept. 1888.

5116. Do you desire to add anything to the statement made by them?—I would like to say that I have occasion to go to the smaller tanners once or twice a week, and out of the whole I do not think there are four that could be placed on such a very bad footing as you have placed them to-day. Altogether, there are only eight small tanneries in Melbourne, and the rest are large ones, and they have a way for filtering the stuff as it goes out of their vats. In many tanneries they have tanks, and some of the small tanneries have those also. They filter from one to the other, and they have three, and eventually when they run off there is nothing but pure water.

5117. You think that system is a good one?—Yes.

5118. You think it does not make a nuisance?—It leaves some dirty refuse in the bottom of the tank, but that tank is cleaned out every six months, and you would not get two loads of stuff out of it in the largest tanneries.

5119. Would it not be better to lime it?—There is always a foot of lime put in the tan water and left there for two days. There is another system one or two of the tanneries have been trying for the last fortnight, that is carbolic acid. It has been in use now for a month, and I find it myself, where I have gone, to be one of the greatest things in a tannery to do away with all stench. I saw a place where there were fifty fresh hides, with one pint of this stuff, and I could smell nothing but carbolic. When that was run into the other vats to filter there was another pint of this carbolic put in, and there was no smell eventually when it ran away. In other places, they put lime at the bottom and let it filter through. One of the largest tanneries in the centre of Collingwood runs off five vats, and this stuff goes through this filtering and runs down the gutter, and there is no more offensive smell from that than from dirty water. That is Thompson's, in Collingwood. I have worked there, and have helped to clean the tanks out, and have lived in a house where the water was running down in front of my nose all day, and I could find no smell of any kind.

5120. Is there any other matter you desire to refer to?—I can only bear out the remarks of Mr. Kennon as to bate. I have seen it worked, and could find no smell from that.

5121. Do you know what it is composed of?—No; it is a patent. It is something similar to cheese, only it is whiter. You get it in blocks like cheese. It tastes something like glucose.

5122. It is less objectionable than fowl's dung?—Yes; there is no smell at all with it. We hope that you will take the matter in hand as soon as possible. We have a petition to present to Parliament, and find we cannot do so till your report is furnished.

The witness withdrew.

Adjourned to Tuesday next, at half-past Two.

TUESDAY, 11TH SEPTEMBER, 1888.

Present:

Professor H. B. ALLEN in the Chair;

Clement Hodgkinson, Esq., C.E.,
A. P. Akehurst, Esq.,

W. McCrea, Esq., M.B.,
T. M. Girdlestone, Esq., F.R.C.S.

Joseph Brady sworn and examined.

5123. *By the Commission.*—What is your office?—Chief Engineer of the Harbour Trust.

5124. It has been stated in evidence before this Commission that one of the chief difficulties in the adequate drainage of the South Melbourne abattoirs has arisen from certain works executed by the Harbour Trust on the river bank; will you kindly describe the nature of the works so executed between the South Melbourne abattoirs and the river bank?—I do not know the level of the South Melbourne abattoirs. I should imagine it to be probably about six feet above low-water mark. All the Harbour Trust reclamation has been banked up to about nine feet above low-water mark, so it would appear that our embankment would be three feet above some portions of the South Melbourne ground. As a matter of fact, as to the South Melbourne abattoirs and the drainage, about ten years ago a small portion of it might have gone into the river, but the main portion went into shallow pools, a sort of lagoon that existed between the abattoirs and the river bank. The level of the ground, the swamp—rather the ti-tree swamp, I remember it in 1850—was about two feet or two feet six above the level of low water, but along the river border was a tolerably firm bank, with very few openings in it, if any. There might have been a little overflow in it; but I remember, over ten years ago, when I was first appointed engineer of the Harbour Trust, all those pools were filled up with the waste stuff from the abattoirs, mostly blood and entrails of beasts, and what was left after the pigs were fed.

5125. As a matter of fact, before the Harbour Trust commenced those works in that situation, was there a drain made between the abattoirs and the river?—There was no adequate drain. There might have been a box covered drain, but I never saw it or heard of it.

5126. Have the works which were executed by the Harbour Trust obstructed the outlet of fluid by such drain?—Certainly not. The very first thing I was instructed to do was to guard against any possible claim for obstructing the drainage in that place, and we put in a stone-paved drain, that cost a lot of money, the full depth of our land from the border of the river and crossing the line of what is called Lorimer-street, and into that drain all the drains of the abattoirs ran. We have banked the ground up to Lorimer-street, so that all the foul-smelling offences that used to exist have ceased to exist, because they have been filled in with good dry earth and sand.

Joseph Brady,
11th Sept. 1888.

5127. Does this explanation apply also to the Port Melbourne abattoirs?—We have a different drain in for them.

5128. Have similar provisions been made?—Yes. The drain now is perfect, if they take the trouble of flushing it. They do occasionally keep the drain clear. The Harbour Trust labourers have had to clear it on one or two occasions, but after several letters of protest they flush the drain occasionally and keep it moderately clean. On Tuesdays, after the boiling down process—I do not know whether it obtains now—the drain used to be something to remember. We have gratings trapped over it, but the delivery is sufficiently above high-water mark to keep it perfectly good, and it is paved the whole way with stone set in sand; good work of its kind.

5129. Are the levels at the head of those drains such that all their drainage could be conducted into it?—They are conducted into it, and they themselves flush the drain out now. If they could be compelled to flush the drain out with water the drain could be kept perfectly sweet, and it is tolerably clean perhaps twice in a month.

5130. If, therefore, some blood still reaches some depressions in the ground near the abattoirs and off the killing pens, it is really culpable negligence on their part?—It only shows they ought to close up those holes. The drain is sufficiently low at the abattoirs end to receive all the drainage from the slaughtering yards; in fact, it does do so, and the managers of the place were consulted at the time we put the drain in. We met on the most friendly terms, and did everything we were asked to do, and the drains could not be made better for the purpose. The objection we have to it is the drainage of such filth into the river, because it completely destroys the berthage for the ships alongside there, and renders it very unhealthy. I know in one place—I could not give you the fact, because I did not know it of my own knowledge, nevertheless I have spoken of it—that the drain comes in from the South Melbourne side down Johnson-street, and delivers into the swinging basin; it is a box drain, fully a quarter of a mile long, and delivers a very foul drainage indeed, fully as bad as, or worse than, what is now under discussion.

5131. Whence does that come?—From the South Melbourne side, along Johnson-street, a drain built of red gum and box, closed in. It looks very nice on top, but the unfortunate man who runs the ferry knows all about it in the night time.

5132. While the Harbour Trust works were in progress, were the outlets from those two abattoirs obstructed temporarily?—I do not know that there were any outlets; there were a lot of indentations like little creeks running in and out of the broken banks through which the drainage found its way, but there was no proper drainage at all.

5133. Most of this drainage stagnated in the low depressions in the ti-tree, and never reached the river at all?—Yes. There was one defined drain that came down from the Boundary-road.

5134. The operations of the Trust, in filling up those depressions, were really a benefit rather than the reverse?—There is no doubt about that. There is an excellent drain from the South Melbourne abattoirs, and an equally good one from the Port Melbourne.

5135. What is the cause of the accumulation of the offensive drainage, especially at South Melbourne; is it the failure to connect properly with the Harbour Trust channel?—I am not aware there is not a good connexion. I believe they have a perfectly good connexion.

5136. What is the cause, then, of the stagnant drainage to be seen there?—I am not aware there is any. I was down there, at the river-side, this forenoon, and I have been on the opposite bank, close to the abattoirs, within ten days. My ordinary duty takes me down there pretty frequently.

5137. If the Commission saw, when they visited the abattoirs, depressions containing water very much contaminated with blood in a putrescent state, that must have been through some carelessness?—The depressions in the ground that have existed from all time, that have not been filled up, still exist; but the South Melbourne abattoirs is the less offensive of the two. The other one is always considered to be the worst; and in that case they have drains leading from the slaughtering yards into our drain, lined with boards; but an overflow from that might possibly take place, and probably did. But the cure for that would be to have the ground filled up, and limit the scope of their drainage into the paved channel, and not leave open pools about. That is a thing that could be rectified at a very little expense and in a short time. In the Port Melbourne one, about one-half of the area of the buildings is inside the boundary of the Harbour Trust; but it was understood that the lessees should have been displaced about two years ago, the 31st December, 1886. It was arranged with the Lands Department that we should have possession of that place, and also of Scott's boiling-down place, next door to it. The obstruction has always been, not the South Melbourne abattoir, but the Port Melbourne one, as a portion of the building actually stands on Lorimer-street.

5138. In your opinion, should those wooden drains from the abattoirs be allowed to exist?—I am sure they ought not. Anything that admits of percolation must necessarily be bad. It should be made of concrete or some impervious material.

5139. In your opinion, are those buildings, apart from any other question as to their construction and material, of sufficient value to justify any improvements?—I do not think so. As to all the buildings that they have got, leaving out plant and machinery, at the South Melbourne abattoir, I should think the value for removal would be very dear at £200.

5140. Practically, they are of no value?—Practically, they are of no value.

5141. Do you desire to make any further statement to the Commission?—No.

The witness withdrew.

Adrien Charles Mountain, M. Inst. C.E., sworn and examined.

A. C. Mountain,
C.E.,
11th Sept. 1888.

5142. *By the Commission.*—What is your address?—The Town-hall, Melbourne.

5143. What is the nature of your office?—City Surveyor.

5144. How long have you held that office?—About one year and three-quarters.

5145. The Commission has desired you to attend to-day in order to give us more information with regard to the alterations which the City Council proposes to execute in the levels and in the buildings of the metropolitan abattoirs. Will you kindly state shortly what alterations it is proposed to make in the levels of the land from the Kensington Hill to the Saltwater River?—The alterations that have been submitted by me to the Council are those which will enable the abattoir land, which is now low-lying and difficult to drain, to be raised above the level of flood-water, and also levelled off to such an incline as will admit of it being readily drained.

5146. Do you remember what the incline is that is proposed?—The general longitudinal fall towards the river varies from 1 in 580 to 1 in 365, with an interval of level ground about the site of the abattoir buildings. Transversely, however, there is an average fall on each side of the land towards the central drain of about 1 in 340, which will carry off the surface water.

5147. Mr. FitzGibbon was not able to give exact information on various points, and referred us to you. Referring, then, to the buildings in the abattoirs, will you kindly state, in the first place, what buildings now existing it is proposed to remove altogether?—If you permit me, I will show you the plans.—[*The witness produced and explained the plans.*]—As to the suggested improvements in those buildings, the drawings are in an incomplete state at the present time. Funds were not available last year for the work of reconstruction, the delay thus caused being used by me for the purpose of obtaining information from other sources before finally deciding on details. Hence, some of the minor arrangements, as hoisting gear, trucks, &c., are not shown in the drawings yet. The general idea of the scheme will be therefore more readily grasped by referring to the block plan.—[*The witness exhibited and explained the same.*]

5148. From your verbal statement, just made, I understand that the quadrangular yards now existing east and west of the ordinary cattle-killing places will be removed?—By the design, that is the intention.

5149. And that, in the line of these present quadrangular yards, there will be simply a series of covered pens for stock in that line?—Yes, in that position there will be covered pens leading right and left to the respective blocks of slaughter-houses on each side.—[*The witness further explained on the plan.*]

5150. And that east and west again of those yards, at the extreme boundaries of the ordinary abattoirs compound, there will be fresh killing-places for cattle?—Yes.

5151. So that those large yards in the centre will serve the purpose of both the killing-places abutting on the main entrance road now existing, and the new killing-places at the ends of the compound?—Precisely.

5152. I understand, further, that the present five cattle-killing places will be removed, and replaced by four cattle-killing places, higher from floor to roof, and wider, but about the same length, on the same site?—Yes; of course, my proposal in carrying that out will be to construct the new blocks first, and, when additional accommodation is given, to demolish the old buildings and erect these of approved design.

5153. The new cattle-killing places will then be of the same length as the existing cattle-killing places, but higher, with louvre ventilation in the upper part of the door, and with a louvred lantern above?—Also louvred at the end.—[*Showing on the plan.*]

5154. And each will be one-fourth wider than the existing killing-places?—Yes.

5155. There is a higher louvre provided in the end wall of the killing-places as well?—Yes, at each end wall.

5156. There is no proposal, I understand, to raise any part of the drafting yards or killing-places above the surface of the ground further than at present?—None.

5157. That is the existing surface?—Yes.

5158. I understand, further, that you propose considerably to increase the number of sheep-killing places, and that the plan will provide for an indefinite extension in the number of such killing-places?—Yes, it will be capable of expansion on either side.

5159. I understand, further, that it is not proposed, in any material way, to alter the level of the land upon which the abattoirs now stand?—That is correct.

5160. I understand, further, that it is proposed that each killing-place shall have a hydraulic lift, the motive power for which will be provided locally?—Yes.

5161. And that this lift will carry all blood and offal on to a raised tramway by which such blood and offal will be conducted to the desiccating place?—Yes.

5162. Is there any further point in connexion with the buildings themselves, or the levels within the killing-places and the covered sheds, on which you would like to make any further statement for the information of the Commission?—No, I think there is nothing else. I understood from Mr. FitzGibbon that he clearly pointed out that the work would be constructed with due regard to sanitation; that is to say, the floors and walls will be impervious to soakage, and will also be rat-proof, which is a great consideration there, because one of the great defects of the present buildings is the fact that the rats penetrate the whole of the walls, and have increased the openings in the joints, which has allowed soakage, more or less, to penetrate. I propose to have the floors of asphalte.

5163. Throughout?—Throughout the killing-houses.

5164. How would you lay that asphalte in the killing-houses, to make it durable?—Pray do not misunderstand me. The asphalte that is spoken of in Melbourne is not asphalte. I do not mean

tar pavement, I mean genuine asphalte, either the Seyssell or *Val de Travers*, or, indeed, any of the natural rock asphaltes.

5165. Would you lay that on concrete?—Yes.

5166. What flooring do you propose to have in the hanging-rooms?—I should propose to include the hanging-rooms in the asphalted portion.

5167. What do you propose to have the partition walls of?—Brick, set in cement for some feet above the floor-level at all events.

5168. And covered with what?—The walls might be covered either with Keene's cement, or glazed tiles, or enamelled bricks; either of those.

5169. Some impervious material?—Yes.

5170. Do you propose in any way to intercept the blood-stained fluid which will pass from the abattoirs, even when the thick blood and offal are removed to the desiccators?—You mean the colouring matter of the washing down?

5171. Yes?—I have thought of that, and, no doubt, some method for treating that will be devised; but I have not decided in what way that will be done yet. It is not a difficult matter to deal with.

5172. You think the large quantity of fluid to be dealt with will not put any great difficulty in the way?—I think not, because I have urged the council to be very stringent as to the catching of all blood, and placing it in receptacles, instead of allowing it to go on to the floor.

5173. A comparatively small amount of water would do, as compared with now, with the impervious floors?—A very much smaller amount. They are very reckless with the water now.

5174. Can you tell us now, by referring to the sections of the land, what depth of filling will be placed over those paddocks in which burial has been going on?—I think the average quantity of filling over the low-lying ground will be about two feet. Of course, there will be places where it will be greater than that, and others where it will be less.

5175. I refer now to the paddocks where the chief amount of burial has been conducted?—*[The witness referred to the sections.]*—There will be, in the deepest part, about three feet, and it tapers away to almost nothing in some parts in the higher ground.

5176. In the lower paddocks, between the present site of the abattoirs and the river, is there any part there in which you propose to have comparatively no filling at all?—In the lower paddocks, between the river and the abattoirs?

5177. Where burial is now taking place, half-way between Bennet's killing-place and the abattoirs, at the rear of the abattoirs going towards the river?—*[The witness examined the section plans.]*—No, I should say that would be about where we wanted the greatest amount of filling; thus at the boundary fence at the back of Bennet's, it would be the easterly boundary of the ground, the section there shows the greatest depth of filling. The longitudinal section there is along the fence beyond Bennet's fence, and that shows the greatest amount of filling of any part of the ground—*[explaining on the plan]*. There it is heavier than any other part, and will slope with an incline towards the drain.

5178. Have you made any estimate as to the amount of filling that will be required in all?—Yes; I think, trusting to my memory, it was about 25,000 yards.

5179. Have you made any definite proposal as to the place from which this filling should be obtained?—No definite arrangement has been made; but I have spoken to the secretary and engineer of the Harbour Trust, and I apprehend there will be no difficulty in our procuring some form of silt obtained in the river or the bay. I think it would be the cheapest way of filling the ground.

5180. Where would you take delivery of it?—In the Saltwater River; we have a frontage there.

5181. Does the amount of filling you have mentioned include the filling proposed to be done in Macaulay-road, with a view of having a subway into the cattle yards?—Yes; that is shown on the section, and was all calculated in the one quantity. That is simply to deal with the local grievance about the driving of cattle. To obviate that, I propose to raise the road, and improve the gradient thereby, and let all the passing of cattle from the sale-yards to the abattoirs take place underneath, and not interfere with the public traffic.

5182. It will be an improvement to the road?—Yes.

5183. Will they be able to kill a larger number of cattle and sheep than they do now by carrying out the proposed scheme?—Yes.

5184. Would there be a much larger accommodation?—*[Inspecting the plan.]*—On these plans, 32 killing-places are intended for cattle, and 16 for sheep.

5185. How many are there now for cattle in the existing abattoirs?—With those two quadrangular yards it is rather difficult to say, because they do the work of more than two slaughter-houses, because both beef and mutton houses are together.

5186. But the accommodation will be larger than at present?—I should say, altogether, there are not, for beef and mutton, more than 24 killing-places. There will be 32 for cattle only, and 16 for sheep.

5187. And those numbers can be increased still further, if necessary?—Yes, there is nothing to prevent extension.

5188. Then you can accommodate more butchers there, if necessary?—Yes.

5189. Would you be able, without any cramping of the room, to provide for all the slaughtering of the Metropolitan district of Melbourne?—I do not contemplate that in the present proposal; but, of course, that could be done by an extension of that plan, I am confident.

A. C. Mountain,
C.E.,
continued,
11th Sept. 1888,

5190. There is room on the ground?—Ample room; there are 54 acres on the abattoirs property.

5191. Is there any further matter upon which you would like to make any further statement to the Commission?—I think not; I think the Commission is now fully seized of all the facts.

5192. Could you state at what height above the low-water level the carcasses of cattle and sheep will be hung in the new abattoirs; in other words, the height of the floors in the hanging-rooms above low-water level?—Certainly; not less than 9 feet. The main roadway or line at the present time varies from about 8 feet to 8 feet 9 inches above low-water level.

5193. How does the tide run in the Saltwater River opposite the abattoirs?—I could not tell you; I never gauged the tide.

5194. The hanging-rooms will participate in the proposed improvements in the way of ventilation?—It applies to the hanging-rooms; in fact, it is all considered as one building; only a wooden partition separates the hanging-rooms from the killing-places.

5195. Is it not a disadvantage having them so low?—The surface of the ground will be on the present level, but the buildings themselves, for the sake of ventilation, more lofty.

5196. That is the roof, but the floor will be the same height?—It would be very costly to raise the killing-places one storey, and hardly convenient in many ways. I do not think it would be an economical way of dealing with the abattoirs, as they exist at the present time.

5197. Will you kindly furnish a sectional plan?—I will do so.

The witness withdrew.

Joseph Cohn sworn and examined.

Joseph Cohn,
11th Sept. 1888.

5198. *By the Commission.*—What is your address?—Kirk's Bazaar.

5199. What is your occupation?—Veterinary surgeon.

5200. You appear here to-day, at your own request, to give evidence before this Commission?—Yes.

5201. On what matter do you wish to make a statement?—I saw the advertisement, and I thought I might give some evidence about abattoirs in Copenhagen, the country I come from.

5202. Will you, then, shortly describe the abattoirs existing at Copenhagen?—First, the city has about the same population as Melbourne. The cities on the Continent are all very closely built; they do not take up room as the cities here do, and the abattoirs here. I was there only for a week, in 1871.

5203. Have you no more recent information?—No.

5204. Are you aware whether alterations have been made? No; but I do not believe there have been any, they were just built at that time.

5205. How far are they from the centre of the city?—About ten minutes' walk from the centre of the city.

5206. Half a mile?—I should fancy about half a mile to a mile.

5207. Are there many habitations around there?—Yes; the abattoirs are opposite the central railway station, and on all sides it is compactly built all round. On the one side there are gardens and establishments for pleasure; on the other side it goes out to the sea.

5208. It abuts immediately on the sea?—Yes; and the drainage is all brought down there.

5209. To the sea?—Yes. Of course, it is built very compactly, and is all brick; and floors with open drains.

5210. How are the bricks laid in the floor?—I could not say; they are square bricks, like tiles.

5211. Are they laid in cement?—They might be, but I cannot say.

5212. You do not know the details?—No.

5213. What is done with the blood and the offal?—It all goes to the sea; it is all pumped out; they have machinery to pump it out.

5214. Is it treated in any way before it goes to the sea?—No, not that I know of.

5215. Are no complaints made by persons residing near the abattoirs?—No; there is no smell whatever, you could live inside, in fact; the veterinary surgeons are in the place, and I stopped there the whole time; the climate is not as hot as here, of course.

5216. Were you ever down at the place where the blood and offal are delivered into the sea?—No.

5217. Do you know the nature of the coast; is it a shelving beach?—It is very flat in this part—very low; it is a part of the Sound which goes in; of course, it is deep when you get far out.

5218. You have never been down to the spot?—No.

5219. Have you any kind of fish that would make a clearance?—I suppose so.

5220. Is there any other matter of importance about the Copenhagen abattoirs that you desire to bring before the Commission?—No, I only wanted to state that the abattoirs were almost in the centre of the city, close to the railway station and the beach.

5221. And that there is no nuisance arising to people passing in the immediate neighbourhood?—No, no one would have the slightest idea they existed there.

5222. And this abattoir's killing goes on for the whole of the population?—Yes, there is only the one abattoir.

5223. And the killing there is for a larger population than the Melbourne abattoirs?—They have a population of about 300,000 inhabitants.

5224. The Melbourne abattoir does not supply all?—I know.

5225. Is any difficulty found, practically, in Copenhagen in supplying the different parts of the city from this one general abattoir?—I never heard of any.

5226. Is your experience such as to enable you to know whether there was any practical difficulty?—I was only there for a week; but the distances from one end of the city to the other were not so great.

5227. Is there any other matter you wish to speak on?—No.

The witness withdrew.

Edmund Gerald FitzGibbon further examined.

5228. *The witness.*—I was asked to produce copies of the Crown grant of the cattle market and the abattoir reserve; I beg to hand those in.—[*The witness did so.*]—I would say, at the same time, what I did not refer to when I was last under examination. I have here the conditions under which certain persons are allowed to treat the offal or residue of animals at the slaughter-yards, and I produce them for the purpose of placing before the Commission the assurance that the first object in the mind of the Corporation of Melbourne, in dealing with the abattoirs and its surroundings, is to avoid and prevent the possibility of nuisance; I may go on to say that if any of those conditions are traversed, and the statement has gone forth that they have been traversed, the Corporation are prepared to step in immediately to prevent the creation or existence of any nuisance. They recognize the fact that they are a body for the purpose of prevention of nuisance and not of creation, and thus it is only necessary to make them aware that there is a nuisance existing within their limits to cause them to use their utmost energies for the removal of it. I have taken the opportunity of attending, more especially, because I made a slight error in the last evidence. I stated that there were three persons only in occupation; there are, in fact, four engaged in the treatment of animal matter by boiling down such into tallow; and there is a fifth who is engaged in a very interesting and advantageous industry, that of treating the gut produce of the place. I have had the pleasure of sending up to the Melbourne Exhibition specimens of that man's work, which, I think, are highly creditable as exhibits, a thing to be satisfied with, as proving there is intelligence and industry to prevent waste and turn these substances into a valuable material—the material I speak of is some of the gut-rope—which is specially manufactured for Mr. Wolsley's shearing machines, and a quantity of whip-cord, exceedingly well manufactured for all purposes to which animal gut can be applied.

5229. Have you ever visited that establishment as to the preparing places, as distinguished from the manufacturing places?—Frequently.

5230. Do not you think the condition of the room in which the cleaning of the gut is conducted, practically, amounts to a nuisance, and one of a rather nasty character, involving also the passage of a large amount of fluid contaminated with the scrapings and contents of the gut into the river?—As far as that is concerned, I have been at the place frequently. I am aware the contents of guts are washed into tubs, and the contents of tubs into drains, and doubtless they do reach the river; but it has not suggested itself to anybody connected with the matter that mischief was done thereby.

5231. Is it not a fact that the contents of tens of thousands of sets of intestines are taken to the river in this way?—Possibly.

5232. Is that a thing that should be permitted—could not all that matter be retained and used as manure?—No; I think it is in too fluid a condition to retain it and convert it into manure.

5233. Should it not be precipitated?—The process of precipitation would be one so expensive that it would be a question of whether it would be worth while to continue such manufacture; if great expense was incurred in that, it would necessitate the abolishing of the industry.

5234. If you were aware that the contents of the bowels of tens of thousands of animals, apart from that industry, went into the river, would you allow that?—Certainly not, if it were proved that it did injury to the river, or anything dependent on it. Seeing that the river is of salt water, and not potable, I do not look upon at all with the same consideration as I should if it were a fresh-water river, the water of which was capable of being drunk.

5235. But even then, allowing it simply to be a drain, calling it a drain to the sea, would you let that matter go into the drain?—I can see no objection to use a drain to carry away offensive matter; I should imagine that was what a drain was made for.

5236. Do you regard a tidal river as a proper drain for matters of this kind?—As I have already said if I conceived that it was an improper thing so to treat it, the treatment of it in that manner should be stopped, and it is only necessary to point out to the Corporation that appreciable injury in any direction is done to have it stopped; the Corporation has no interest whatever in polluting rivers; it has no desire to do so; its desire is cleanliness and purity; and as to the consideration of pounds, shillings, and pence, that does not enter into the mind of the Corporation at all in this matter; in fact, the statement of figures I have put before you is a proof that the Corporation is working the abattoirs at a loss rather than a gain; it certainly has not suggested itself to me that the treatment of those guts in the manner they have been treated was doing any injury to the river; if it be so, such treatment, together with the other industries there, if they be offensive, will be stopped without hesitation.

5237. If any great amount of filth was deposited in the Saltwater River, would not the Harbour Trust be likely to detect it in dredging below the junction of the Saltwater River?—I

Joseph Cohn,
continued,
11th Sept, 1888.

E. G. FitzGibbon
11th Sept. 1888.

E. G. FitzGibbon
continued,
11th Sept. 1888.

apprehend that so practical a body as the Harbour Trust would. They do write to me occasionally; in fact I have a letter complaining of the manner of cleansing the streets just now, and I apprehend that the same body which calls my attention to that would call my attention to injury being done to the Saltwater River if they had appreciated any such injury, and they have not.

5238. Is it not a possible explanation that the condition of the lower part of the river is universally admitted to be so bad that the Harbour Trust do not think it worth while moving in the matter?—No, on the contrary, my acquaintance with them makes me think them in this regard the most valuable body in the colony, there was no jurisdiction given to the Corporation of Melbourne over the river, such as had been given to the Corporation of London over the Thames, nor to any other body until the Harbour Trust was created; the Corporation of Melbourne was utterly powerless; there is a worthy member of the Commission here present who, with myself, has rowed down and up the river. We have nauseated and disgusted ourselves times without number; we have written reports containing in them the most plain, practical, matter-of-fact statements about the abominations of the river below and above Melbourne, and have endeavoured with the utmost of our power to have them done away with. Whilst my most respected friend, Dr. Girdlestone, was health officer of the city he was, and before that time, and since, I myself have been striving for years with all my power and all the power of those working with me in the Corporation of Melbourne to get the River Yarra purified, and with that object to get some one governing body empowered to exercise control over the river. We had not succeeded in doing it till the Harbour Trust was created; and that body, in regard to the lower river, applied itself, in the first instance, to removing offensive works; I will not mention names—there were a number of worthy gentlemen who had works, some of them on the northern side of the river near to the Gasworks, and above it, so abominable that no words that we could use were sufficient to express our indignation at the existence of them. There were others on the Emerald Hill side of the river so disgusting and filthy that I, myself, have been made stomach-sick in walking through them, and no steamboat could reach the city by the river without every person on board of it being put into a state of nausea by the stench that came from those works. All honour to the Harbour Trust, it set itself vigorously to work, and has cleared the river to that extent, so that it is now capable of being traversed without such annoyances, but it is not from any discharge of those infinitesimal matters from the abattoirs that any offence was ever perceptible. I would say this, as to the condition of the River Yarra and its silt, as compared with the silt from English rivers, there is this marked difference, that the majority of the English rivers have been the receptacle of drains and sewers for the fecal discharges from the towns which necessarily polluted the river. By the action of the Corporation of Melbourne, which has been followed by the municipalities around, fecal discharges are prevented in the river; and, as to the condition of the silt, the best example is that the greater portion of the fore-shore, and back thence to the inhabited portion of South Melbourne, is now filled up to the height of some four or five feet chiefly with it. So far from being offensive, it is a most valuable material with which many of the great spaces now being or about to be built on were filled up.

5239. The point that was vexing me was this: I suppose that if anybody were deliberately to take down a cart-load, say, of stable-manure and turn that into the river, he would be considered to be guilty of a grave offence. How is it, if that be so, that a manufacturer can turn the contents of tens of thousands of sets of bowels into the river without its being considered an offence?—Because the contents of those bowels are so diluted that they pass into the river without the same offence as would be caused by the solid material. A cart-load of stable-manure would float upon the water and be far more offensive; those are diluted and pass into the river, and, therefore, there is less offence.

5240. I understood, at the time of my visit to that gut factory, that they separated all the solid matter, and carted it away and buried it. I must say I had some little doubt as to whether that was carried out, and it appears to be your own belief that the greater part goes to the river?—Pardon me; as far as the solid matter, the information given you is correct. All solid material is taken away and buried in the ground; and it is only the washings, after that solid matter has been removed, that, so far as I know, is allowed to go into the river. And I would take the opportunity of saying as to that burying, about which there has been an enormous amount of sensational writing and talking, that I have been where it has been carried on, and I have no hesitation in saying, with all the solemnity that belongs to the statement of a man who is upon his oath, and I have been sworn before this Commission, that, so far from any injury whatever, or any disadvantage arising from it, that that process has been utterly inoffensive to anybody at a distance of 200 yards away from it. I say 200, for fear that, if I mentioned a distance of 100 yards, I should be exaggerating. I have passed in the line of the wind from the places where those trenches have been opened, and have accurately gauged how far it was possible to detect any odour arising from any process that was going on there; and I have no hesitation in swearing that, at 200 yards from where the process has been going on, it would be impossible for any person to say that there was any such process then in operation. Furthermore, in regard to it, I am in a position to say, with equal positiveness, that the process has been all good and no injury. I remember that ground from the time that it was first taken possession of by the Corporation of Melbourne. It was then land which was frequently flooded. It was heavy, close packed, and dense, as such land would probably be. There grew upon it no other vegetation than the swamp weed; I have not mastered the botanical name of the weed, but it is one I know very well indeed, for I have seen it growing in swamp grounds over and over again, and some fortnight or three weeks ago I was down at the abattoirs, and gathered some of it, and I think I have, perhaps, a flower or two of it—[*exhibiting the same*]. A little yellow button weed; it grows usually in swamps. That weed covered the greater portion of the ground, and was the only vegetation that grew, creeping close to the ground. The effect of

the process of burying the contents of the stomachs of animals has been to open up that sodden ground, oxygenate it, and lift it, so that now a portion of that land that has been trenched is, I should say, from observation without measurement, at least fifteen inches higher than the original surface, and the portion of it that has last been sown with grass has got as beautiful a sward as ever clothed any English meadow. The land is improved; the appearance of the place is improved; the whole of the surroundings are improved; and when it is borne in mind what the contents of those animals' stomachs are, digested, or semi-digested vegetable matter, it is manifest that no better fertilizing material could possibly be put in the ground. That is the process which has been going on, and which has been spoken of in language that was intentionally gross, talk of as "burial grounds" and so forth. The land is very much improved by the process; but as to the solid matter from gut factory or that produced at all those places, no portion of it goes into the river, the drains into the river are grated and built to stop the solid matter; and when I was speaking of that which escaped from the guts, I spoke of that after the guts were washed.

5241. The small contents that pass into the buckets in which the washing is done?—Yes; I would like to return to those conditions, and would merely as comment on them say that the Corporation, of course, in giving permissive occupaney, is bound to guard itself against giving an adverse possession to any one. For that reason, the Council put on the occupation of the area given to each of those people a small payment of an annual sum. It is provided that they shall pay that sum annually to the Treasurer. Secondly, and these are the important conditions, "That the animal offal and refuse resulting each day from my business at the abattoirs as a butcher, shall be boiled down on the same day." That, I need scarcely say, is with the intention that there should be no decomposition. "And that it, and any other animal or other matter which shall be boiled down upon the said premises, shall be so boiled down only in air-tight vats, of which I hereby undertake that I will erect one forthwith, and as many more as may be requisite for my business, if one be, in the opinion of the City Council, insufficient." "I"—(the person has to sign that declaration therefore, it is put in the first person.) "I, my heirs, executors, or administrators, shall and will, within one calendar month from the date of such notice, cease and discontinue to use the said land, and yield up to the said Council, its officers, servants, or appointees, peaceable possession thereof; and shall and will remove from the said land and from the said abattoirs' reserve all such animals, offal, animal and other refuse, pens, structures, materials, matters, and things whatsoever." That is the set of conditions which apply to butchers slaughtering at the abattoirs. There is one man, named Quinn, who, though not slaughtering himself, is receiving the materials from others, who, not having premises within which to dispose of those materials, employ him for the purpose, and the conditions were slightly varied to meet that particular case. Those are the conditions upon which occupation has been allowed. And supposing that it is clearly necessary, in fact the Corporation already—the health committee of the City Council is the executive of the Corporation in those particulars—has resolved that in so far as those places are objectionable to the eye and deemed offensive, they shall be removed.

5242. Is there anything further that you desire to speak on?—No, I do not know that there is.

5243. Do you think it would be possible in places like that gut factory to have some similar system of filtering?—Really the City Council would, rather than leave itself liable to the question of creating a nuisance or the adoption of expedients, let it go somewhere else, and have no trouble; but, of course, I think it quite possible. There can be no doubt that in the tubs where those guts are, after the solid matter had been taken from them, and they had been washed, it would be very easy to put in a precipitating material, so that only clarified water should be allowed to escape, and the solid material be buried like the rest. I shall be very happy to cause that to be done in the meantime. The old man working there is a very intelligent working man, and I am very sure it would be only necessary to suggest to him that it would be necessary to adopt such a process, and if he did not, it would be reported. I feel it is only necessary to suggest to him that he should adopt that process. I will take care to note that. One of my reasons for coming was, that having been asked by you for copies of the Crown grants, I have had copies made, and brought them.

5244. There was one matter in your evidence that I thought you might like to check, and that was the statement with regard to the raising of the floor of part of the new pens or killing-places at the abattoirs. We understand from Mr. Mountain that the floor will not be raised, that the apparent platform is simply part of the foundation that was shown in the plan?—He, of course, will know more of that than I, and in producing his plans I informed you they were his and that he could speak with confidence, which I could not, with regard to them. I may say this, there is only one object on the part of the Corporation of Melbourne, that is to take care that, whilst providing for a cheap and ample supply of food for the metropolis, it shall adopt every possible means that human ingenuity and skill can suggest for effecting these great and necessary objects in the least offensive and best manner.

5245. I understand the plans submitted by the engineer have been approved by the City Council?—Yes, so far as they have yet gone.

5246. And the City Corporation propose to carry those out, very possibly commencing next year, with the next estimates?—No, not the next estimates; the Corporation will be contracting a loan. Its borrowing powers are more limited than the borrowing powers of municipalities, restricted to a five years' annual revenue, and, therefore, having contracted one loan, it has to wait until the payments off that loan have given it a fresh margin within which to work. That margin will be attained at the end of the present year, and relieve the Corporation's borrowing powers, and will enable it to effect the improvements in the abattoirs, and various other matters.

5247. In the meantime, you have ordered the desiccators?—The desiccator is nearly complete.

The witness withdrew.

John Harkes Craig sworn and examined.

John H. Craig,
11th Sept. 1888.

5248. *By the Commission.*—You are the Mayor of the town of Williamstown?—Yes.

5249. In your opinion, is the condition of the Williamstown local abattoirs satisfactory?—They are satisfactory so far that they have been worked satisfactorily, and still they are unsatisfactory; at the present site the drainage flows into the swamp, and if we had a site by the Kororoit Creek it would be very much better.

5250. Is the present system of burial of blood and offal satisfactory?—Perfectly.

5251. Have you ever been, without notice, to the abattoirs and gone to the lee side of the burial place?—Yes.

5252. Have you noticed any offensive smell?—None whatever.

5253. Have complaints been made to you of offence arising from the management of the abattoirs or from the method of burying the refuse?—We had complaints from Mr. Taylor.

5254. Not from any other source?—No.

5255. On the day when the Commission visited the abattoirs, there was a most offensive smell strongly perceptible as soon as we reached the Gasworks. That smell came from the abattoirs, and there was a most offensive odour from the pit in which the offal had last been buried; most offensive is a very slight term to apply to it. It is your opinion, then, that such a condition as that was an unusual one?—Very unusual, and the only way I can account for the smell was from the vat where the offal is boiled; and that is condemned and to be removed to a shed further off, away from the beef slaughter-house.

5256. On the day we visited, there was a pit filled up within a few inches of the surface, very lightly covered, so that when I dropped the point of a pick into it I could look at offal and blood, and there was a most filthy odour coming from it. Have you noticed that?—No; I have tried a pick and stick, and found the depth of the pits was five or six feet; and I have tried some of the pits covered up.

5257. You think this was an exceptional case?—I think it must have been.

5258. What improvements does your council propose to make in connexion with its abattoir system, if any?—The only improvement that we can make is by removing the boiler from under the roof of the beef slaughter-house outside. You may have observed two boilers under one roof there. We contemplate removing the large one from under the beef slaughter-house to the other on the opposite side, away from the meat after it is killed.

5259. Do you propose to alter the method of drainage in any way?—We cannot do that.

5260. You are bound, on that site, to let the drainage pass into those lagoons?—Yes.

5261. In your opinion, is it desirable to have pigs at the abattoirs, and have them fed with blood coming from the slaughter places?—No, I do not think it is. But it is advisable to have pigs there, for the butcher to be able to kill them. I think four is the limited number under the present lease of the abattoirs.

5262. Is that number, four, adhered to?—I believe it is. Sometimes there are two pigs, but they do not belong to him. I went, yesterday, to see the state of the place, unknown to the lessees, and it was perfectly right; but there were two extra pigs belonging to another butcher.

5263. Are the sties for keeping the pigs satisfactory?—They are. They were clean yesterday morning.

5264. Is the floor in the sties of such a character as to enable them to be kept clean easily?—Yes.

5265. Are there not deep interstices between the pitchers in the sties?—No, I do not think so. They are not wide enough to allow drainage to go through.

5266. Is it absolutely necessary there should be abattoirs at Williamstown?—No, I do not think it is absolutely necessary.

5267. You think Williamstown could be supplied if there were proper railway or cartage arrangements for conveying the meat from the Metropolitan Abattoirs?—Certainly.

5268. Respecting the pigs, are you aware that those pigs frequently devour some of that blood that is there?—Yes.

5269. And they are kept there previously to being killed?—No, those pigs that are in the sty belong to the lessee. I found four pigs there, and they were lapping up some of the blood, which I believe is done in pretty well every slaughter-house; and they get other food besides that.

5270. Do you think it is desirable?—I do not think it is.

5271. In your opinion, would it be possible for you to abate the nuisance in connexion with the abattoirs by causing a drain to be constructed, not into the swamp, but round the side of the swamp, into the Kororoit Creek?—It could be done, but it would take money.

5272. Would it be very costly?—I think it would. I cannot state what it would cost, but it would be more than we would be prepared to pay, considering the amount of work that is done at the abattoirs.

5273. Does that establishment supply all Williamstown, or do some of the butchers get their meat from the Metropolitan Meatmarket?—I think it supplies the greater part, with the assistance of the freezing works of Messrs. Elworthy. But yesterday, when I visited the place, everything was clean and sweet and neat.

5274. Has that something to do with the fact we visited it lately?—No, it shows the place is fairly kept. It looked in the average state of cleanliness.

5275. Is there any matter on which you would like to make a statement?—We could do with a better site, if we could get one. We have made an application to the Government to receive a deputation on the subject of site. That is in the hands of the Rifle Club Association.

5276. You desire a piece near the Kororoit Creek?—Yes.

The witness withdrew.

George Frederick Smith sworn and examined.

5277. *By the Commission.*—You are the Town Clerk of the town of Williamstown?—Yes.

5278. How long have you acted in that capacity?—Twenty-five years next April.

5279. Do you concur in the evidence the Mayor of Williamstown has given?—I do, thoroughly.

5280. In your opinion, then, any such offensive condition of the abattoirs as this Commission found at its visit is an exceptional thing?—I should like to ask what is the date of that?

5281. It was since the new lessee came; July the 5th was the day?—Yes; that would be the new man. The abattoirs are kept much better than under the previous lessee, and it is just possible he was clearing up something left by his predecessor. I can say that he has had a great deal of difficulty to contend with in clearing up the abattoirs from what was left in them.

5282. Do you think it possible for the abattoirs to be conducted on the present site without being a nuisance?—It would be very difficult.

5283. Could the drainage be taken from the present site to the Kororoit Creek at the cost of any sum which your council could possibly expend?—No, it would cost nearly if not quite a thousand pounds.

5284. Is that going in a straight line?—Yes.

5285. What is the site that the council desire to obtain for the purposes of the abattoirs?—One immediately on the west side of the Rifle Butts Reserve, close to the Kororoit Creek, with a view of draining directly into the sea; and it is not required by the Butts authorities at all. The drainage would be a very easy matter there.

5286. The west side of the butts?—Yes, adjoining the road east of Mr. Knight's paddock. The road divides his paddock and the piece we want.

5287. Where does the creek empty itself?—Into the Bay.

5288. Is it on the western side of the rifle butts?—Yes, the land is on the north-eastern side of the creek.

5289. Just before you get to the creek from Williamstown?—Yes.

5290. Does the creek run far before it reaches the Bay?—No.

5291. Are you aware whether any large amount of meat is at present taken to Williamstown for local consumption from the Metropolitan Abattoirs, or the Metropolitan Meatmarket?—I have not the slightest idea.

5292. In your opinion, could the town be supplied directly from the Metropolitan markets?—I should think so. I do not see any difficulty.

5293. Is there any matter connected with the abattoirs or noxious trades about which you would like to make a statement?—I would like to make a statement about the drainage, of which we have heard so much. The nuisance caused by the drainage into that swamp has partially arisen from the fact that the Freezing Company emptied a large quantity of their waste water into that swamp, and there was also a large quantity of water from the construction of the Newport Gasworks. In fact, for months before this drainage was turned into it, there was no water in the swamp at all; and anything that came from the abattoirs could be buried and made as innocuous as possible.

5294. Is it not a fact that there is a distinct and very offensive odour round the outfall of that drain which leads from the abattoirs to the swamp. There is a little pit, and from that the foul drainage broadens out?—Formerly, when it was dry, those pits used to be deodorized and the contents carted away; but now, of course, the water flows into them, and all over the surface.

5295. Must there not be a very offensive smell there?—Oh, yes, now, under the present circumstances.

5296. Can it with any propriety be allowed to continue?—I should think not.

5297. Do you propose to take steps to stop it?—The council have had under consideration the scheme of Mr. Champion's, but they consider it too expensive. They would rather remove the abattoirs to the other site, and they have applied to the Government.

5298. Do you propose to take any steps to intercept this drainage and precipitate it?—I cannot say. I am sure the Council will do their best to abate any nuisance.

The witness withdrew.

Adjourned to Tuesday next at half-past two o'clock.

TUESDAY, 18TH SEPTEMBER, 1888.

Present:

Professor H. B. ALLEN, in the Chair;

T. M. Girdlestone, Esq., F.R.C.S.,

R. Reid, Esq.,

W. McCrear, Esq., M.B.,

Professor D. Orme Masson.

William Henry Husband sworn and examined.

5299. *By the Commission.*—What is your address?—24 Darling-street, South Yarra.

5300. What is your occupation?—Solicitor.

5301. I understand you appear before this Commission to-day on behalf of certain residents in South Yarra who have signed a memorial to this Commission?—I do.

Geo. F. Smith,
11th Sept. 1888.

W. H. Husband,
18th Sept. 1888.

W. H. Husband,
continued,
18th Sept. 1888.

5302. Do you desire that that memorial should be put in evidence now?—I do.—[*The same was read, as follows:—*]

“The Royal Sanitary Commission, 119 Collins-street-east, Melbourne.

“13th September, 1888.

“SIRS,—We, the undersigned, being residents of South Yarra, desire to bring before your notice the nuisance caused by the smell from the large skin and wool-scouring establishments situate on the Yarra banks, close to South Yarra. Whenever the wind blows from the north and east in summer every window and door must be closed, notwithstanding the heat, to exclude a sickening smell causing nausea so great as to prevent rest, and thus excessively detrimental to the health. We cannot but regard the pollution of the river from this and kindred nuisances as a source of danger to the health of those who reside near its banks. We feel that, by being subjected to this inconvenience, our rights as citizens are unfairly affected, and we urge that the comfort of our lives is as valuable a possession to us as their business can be to the firms who create the nuisance. We most respectfully trust that you will help us to overcome this injustice, and we assure you that we will support you in any way you may be good enough to point out.—Frederick Tate, F. Boardman Clapp, Francis J. Stephen, E. A. O’Hea, T. Brentnall, Henry Hoyt, Wm. Essington King, W. H. Stephen, Charles F. Crouch, David Whitley, J. Rankin, and a large number of other gentlemen.”

5303. Do you concur in everything stated in this memorial?—I do; and I say I have lived in the same street for the last ten years, and specially during the summer months the stench is intolerable. You cannot keep it out by shutting your windows, though you want to cool your rooms after the heat of the day. You must not open the windows; you are obliged to shut your windows, and that does not keep it out. It gets down the chimneys, and the bedrooms are full of this stench all the night; in fact, one member of my family has suffered very severely from nausea throughout, and I cannot help thinking where there is no fresh air, and where the atmosphere is very still, the whole of this stench is disseminated from the top to the bottom, and goes further up the hill I am told.

5304. Are you aware what is the particular part of the process conducted at those factories that causes this nuisance?—I am not, but there is certainly one thing that is a perfect nuisance to the neighborhood, and that is those pelts, which are almost always in an offensive state, and are constantly being taken through the streets just at the back of our houses. There are sheeps’ heads and those filthy pelts which are taken down there, to clean I suppose. It is not only the pelt, but it is almost part of the carcass of the sheep, and those are constantly being carted down there. I am not aware what the stench is, but every gentleman is aware of the stench of a fellmongery. I am not an expert, and I do not know the particular part of the process which is so unpleasant, but I conceive that the stench that assails one so often to the exclusion of thoroughly fresh air must be very detrimental to health.

5305. In what manner do you conceive the River Yarra is being polluted by the operations of these factories?—More especially on the South Yarra side, the factories throw the refuse into the Yarra. The scum on the Yarra just about the bridge is something very offensive; in fact, in summer, gentlemen passing over the Yarra must have felt the inconvenience of travelling by the railway; you can hardly conceive the stench that comes into the trains. The Yarra at this point is nothing but a great drain.

5306. Can you say that any perceptible part of the smell there is traceable to this scum on the Yarra, or to any discharge into the Yarra?—That I cannot distinguish, but it must be owing to the materials sent into the Yarra from those places, because at other places just below and above it there is no sensible smell. It is only about 100 yards below that, and about the place of the fellmongery, that you notice the great stench.

5307. Within your own experience, is there any difference between the appearance of the river opposite those factories from the appearance above and below?—A great deal; the scum on the Yarra apparently, for some depth, is most offensive, and that scum is constantly being driven against the banks, and there it stays for a considerable time.

5308. Have you such knowledge as to say whether those trades could be conducted in the present locality without causing offence?—No, I have no expert knowledge, but an attempt to modify the unpleasantness has been made on several occasions by the local board of health, and always unsuccessfully. It seemed just as bad very shortly after the attempt to put it down as before.

5309. Is it mentioned the particular place you complain of there, or is it generally?—No, there are two fellmongeries, one on one side of the Yarra, the South Yarra side, and one on the Richmond side.

5310. Are they near one another?—Just opposite.

5311. Two, close to the railway bridge?—Yes, and one on the opposite side; they are near the railway bridge.

5312. What is the distance from the nearest of those places to your residence?—I should think, as the crow flies, it would be about 300 or 400 yards.

5313. And the other gentlemen that have signed that memorial, do they all live in the immediate neighbourhood?—Yes; all in the immediate neighbourhood.

5314. Names are not of much value, if we do not know what position they are in?—They will be better able to give evidence of that themselves. I understand there is evidence in the room to prove that they are immediately around.

5315. It does not state so in the memorial, only that they are residents of the district of South Yarra?—I think I can tell the chairman that many of the names that are here are those of people in the street where I live, within a few hundred yards of the place.

5316. You speak from actual experience in your own house?—Yes. I have inveighed against that for the last seven or eight years.

5317. How often have you applied to the local board?—It has been done, with no success, I think, three times. W. H. Husband,
continued,
18th Sept. 1888.

5318. During what period?—During the last three years.

5319. Once a year?—Yes.

5320. And each time has it been attended with benefit?—Not the slightest.

5321. Has the failure been due to the local board failing to take any proceedings?—I cannot say, but Dr. Bage will be able to speak of that. The inspector of the local board stated that it was not injurious to health at all. I believe he is a medical man, and I was astonished at it. In answer to that, it certainly never has been abated. I have been resident there for ten years, and it never has been abated, especially on the occasions when it has been brought before the local board, when it was said the inconvenience would be abated. It never has been abated. It is not every day, but sometimes it may be for a week together, that the nuisance is created, but it is continuous. I do not know whether I have any right to speak as to the people in the petition. I notice that we have said that we have just as much right to fresh air as they have to make the nuisance. But there is one thing to be said for those fellmongeries—I believe that is a question that might have to be reported on by you, the question of compensation. Those properties are enormously enhanced in value by the filling up with residences; they will get an increased value for the land. There will not be any loss to them, because the increase in the value of their land will be enormous. Richmond is coming down close to them, and so on my side of the Yarra. I mention that as the question of compensation might arise, but after being a nuisance to the inhabitants for so many years I do not think they are entitled to any compensation.

5322. Is there any other matter on which you desire to make a statement to the Commission?—I do not think I could say any more.

The witness withdrew.

Dr. Charles Bage sworn and examined.

5323. *By the Commission.*—What is your address?—145 Toorak-road, South Yarra.

5324. Are you a doctor of medicine?—Yes.

Dr. C. Bage,
18th Sept. 1888.

5325. Your name appears among the signatures of this memorial addressed to the Commission?—Yes.

5326. Do you concur in everything stated in this memorial?—[*Reading the same over*]—Yes, I do.

5327. Are you the health officer of the district?—No.

5328. Do you desire, in any way, to supplement the statements here made?—I would like to say, speaking about the proceedings that have been already taken to alleviate the nuisance, that in April, 1886, there were several close days, and the smell was occasionally unbearable; then, for the first time, I became convinced that it was injurious to health. I found that in the course of personal experience.

5329. In what way?—It made me sick one day. I had for a long time looked upon it as a nuisance; then I thought I could safely say it was injurious to health. Before that, I was uncertain whether I could exactly say so. I wrote to the Central Board of Health about it, and had a prompt reply, saying that the proper course was to send a complaint to the local board of health, and that if two medical men, or ten ratepayers, or the health officer of the district, made a complaint to the local board of health, that board would have to take action in the matter. So a letter was drawn up; it was signed by myself, two other medical men, and, I think, about 30 ratepayers—the letter was sent to the local board of health; it was not stated what tannery was complained of, but proceedings were taken against McFarland and Dale, tanners and fellmongers, on the south side of the river. When the case came up, about the 1st of July, 1886, in the Prahran police court, Dr. Fetherston, health officer, Dr. McMillan, Dr. Lempriere, and I were in attendance ready to give evidence; and when Dr. McMillan was put in the box other witnesses were ordered out of court, so I did not know any more of the proceedings, except from what I heard after. I heard that it was elicited that the health officer had made a recommendation that the owners of those tanneries should be ordered to use some disinfecting process, and that this order had not been conveyed to them by the city inspector—that is another name for the inspector of nuisances—that is what I heard afterwards. The case was therefore postponed for a month to give the city inspector time to convey those orders, and I believe on the tacit understanding that if they were carried out and the nuisance abated there would be no further case. A month elapsed, and the case did not come up again.

5330. Was the nuisance abated?—The nuisance never entirely ceased; it was lessened, but it soon reverted then to its usual condition; just before the bringing of the action the nuisance had been very much more than usual. On April 2nd, 1886, a very close, cloudy, warm day, with very light north wind, the odour was so strong as to be very disagreeable at various points half-a-mile away from the tannery.

5331. Can you say whether, on those occasions when the nuisance was very great, the additional offence was due to some change in the method adopted, or due simply to climatic conditions?—Our noticing it was probably due to the method adopted, and it was, I should say, aggravated by climatic conditions. I do not know anything of the methods adopted.

5332. Was any other process at law instituted for the suppression of this nuisance?—I do not know of any other.

Dr. C. Bage,
continued,
13th Sept. 1888.

5333. If this nuisance is so great, why have not other attempts been made to secure a remedy through the existing means?—For some little time after that last prosecution we considered that the law had broken down.

5334. What law had broken down?—I do not know exactly what the indictment was, but they could not indict them as a nuisance, it seemed.

5335. Why?—I do not know. We went there, and we found that our evidence was not wanted; we were prepared to say that the place was a nuisance, but we were not wanted to give evidence. In my own experience, the nuisance is occasional; it is not constant. Of course, the wind does not always blow from the right direction. I believe sometimes with the wind blowing from the tanneries the smell is not particularly noticeable, and on some days the odours seem to hang about the earth more persistently than on others.

5336. Can you say whether the factories could be so conducted as not to cause any smell at all?—No, I could not say.

5337. Are you aware that any inhabitant in a district has a right, if the local board will not proceed against offenders, to take action directly before any court of justices?—I am not aware of the state of the law on that subject. I know we have some further remedy, should the local board fail to act, but I do not know how far the failure of the local board in its action would give us a right to use it.

5338. And also that you could appeal to the Central Board, who could order the local board to do its duty, and, failing that, do the duty at the expense of the board?—Yes, I was told that by the Central Board, and then the question arose—did the local board do its duty in that particular prosecution? I could not say myself, for I never saw any description of the case, and at the time I was ordered out of court.

5339. Would it not be well that the power conferred by the present law should be fully tested before coming before this Commission, ostensibly with a view to get an alteration of the law?—I certainly considered for some time that the power had been fully tested, and that the prosecution had broken down. I know that the local board did what they could in the matter.

5340. They could withdraw the licence from those factories altogether?—I was not aware of that. No evidence was received in the police court that the business was distinctly injurious to health, and I understood it was quite useless to go to the police court to say it was a nuisance unless I could say it was injurious to health; hence my inaction till I knew of a case. Being myself sickened by the smell—that was before the action in court—was what prompted my letter to the Central Board; then the answer of the Central Board prompted me to write another letter, and obtain the signatures of the ratepayers, and from that the action arose.

5341. Are you aware, in your own experience, whether this matter has been brought before the local board on any other occasion?—No, I am not aware.

5342. Have you any definite suggestion to make to this Commission as to the mode in which such alleged nuisances should be dealt with?—I am not fully aware of the state of the law in the matter. I believe there is an Act that bears on it, the Yarra River Pollution Act, passed about eight years ago, and I believe it gave a definite time at the expiration of which all fellmongeries and other nuisances were to disappear from the River Yarra. I only heard of it about a week ago, and had not time to acquaint myself with that Act.

5343. Did you go to this place, and see what this nuisance arose from?—Yes; I went down to the outskirts of the place and looked for sheeps' heads.

5344. Did you ascertain when you went there what the nuisance arose from?—No; I was never inside the tanneries. I do not think the strong odour is from the washing of wool. I have noticed that the pelts on their way to the tanneries are sometimes disagreeable as they go through the streets.

5345. Have you ever visited any of the other fellmongeries on the river?—No.

5346. You were speaking of tanneries, fellmongeries, and wool-washing places?—Yes.

5347. Are you speaking of any particular places?—Only the ones I have noticed on the south side of the Yarra.

5348. Which are they?—I was not aware till I heard the other evidence that there were two, but as you approach the river by the railway from South Yarra on the east you will see a long low shed, and a wooden building beyond it; they put the wool out to dry on the hill side, and hang skins on the fences.

5349. That is close to the railway on the right hand side?—Yes; then a little further on there is a brick building. It seems to be in the same grounds.

5350. Are you referring also to the tannery?—Tanning goes on at the same place—in the same collection of buildings.

5351. You refer to the place in the corner of the railway, bounded by the railway and the river?—Yes, and on the east by the hill. I believe several sorts of operations are conducted there; I do not know whether by one or more firms. On the day when it attracted my attention so much, I actually localized the smell to those particular places—that is to say, I went right round them. I crossed the river and satisfied myself that the smell did not come from the north side, but distinctly from the south side of the river.

5352. And your residence is close to there?—Yes, about a quarter of a mile as the crow flies.

5353. Have you smelt this disagreeable smell you speak of in the houses of your patients?—Yes, and in my own house.

5354. At a distance of a quarter of a mile?—Yes, and at a greater distance than that.

5355. And do your patients suffer inconvenience in consequence?—Yes, many of them complained.

5356. Do you consider it in any way deprived them of fresh air?—I think it tainted the air they were breathing.

Dr. C. Bage,
continued,
18th Sept. 1888.

5357. Was the air pure?—I do not consider that air that so smells is pure. It had a disagreeable odour, that showed necessarily that it was impure. I should qualify a statement in the memorial by saying that it is not a constant nuisance, and that sometimes the windows are left open, notwithstanding the tallowy odour. There are two degrees; a tallowy odour is the more frequent, being a great inconvenience to some people, and much less to others. I do not like it, but as it is merely a tallowy odour. I can put up with it; but sometimes there is a smell of decomposition in the air. That is much more noticeable when the state of the atmosphere is such that odours are carried further without being dissipated. The odour of decomposition is noticeable by any one passing up the river when the wind is blowing from the south.

5358. Do you know where the drainage of this place goes to?—I believe it all goes into the river. I do not know any other way. The natural drainage all goes into the river. A great part of the drainage of Hawksburn and South Yarra goes into the river there.

5359. Is there any matter on which you desire to make any further statement?—You do not wish to hear complaints of other nuisances in the neighbourhood.

5360. Anything regarding the meat trade and noxious trades?—It perhaps has some bearing on that. There is another nuisance in the same locality; a little further down the river, about 300 or 400 yards, a foul drain used, about a year ago, to run into the Yarra from Richmond, and in the immediate neighbourhood of that drain there was this disagreeable odour. I thought at the time of the tannery prosecution, the defence might be that the Richmond drain was the cause of the nuisance.

5361. You have satisfied yourself that, both from this drain and from the tanneries, distinct offence arises?—What I know of the drain is about a year back. I have not been on that side of the river for a year.

5362. You satisfied yourself, on the occasion of the visit to the tanneries, that offence did arise from them independently of this drain?—Yes.

The witness withdrew.

James Richardson Willing sworn and examined.

5363. *By the Commission.*—What is your address?—139 Church-street, Richmond.

J. R. Willing,
18th Sept. 1888.

5364. What is your occupation?—Since I arrived in Melbourne I have engaged in no business at all.

5365. How long have you been in the colony?—Three weeks.

5366. Where do you come from?—From the United States of America, State of Maryland, City of Baltimore.

5367. You desire, I believe, to give evidence touching the meat trade in the United States?—Yes.

5368. What experience have you had in that matter?—So far as the slaughtering business is concerned, for the State of Maryland and the City of Baltimore. I have had the honour of serving in the Legislature there in 1880 and 1884.

5369. In what capacity did you serve?—As a member of the Legislature in Baltimore City; I want to speak plainly about that. In 1884 we passed a law there on account of cattle that were coming into the city that were butchered before they came there, the meat being very inferior; we passed a law that all meat should be killed within five miles of the city, or within one mile of the city limits. Since that time I have been in New York, and travelled.

5370. Has that law been altered in Baltimore since that time?—I do not think it has, because it was passed at that time on account of the inferior meat being killed outside coming into the city.

5371. From what place did the dead meat come to the city?—No particular place.

5372. Where did the bulk of it come from?—That I am not prepared to answer, but I want to say this, that the meats that were killed and were coming into the city were of such inferior quality that the city authorities thought that it was improper, and the result was that they passed a law that all meat should be killed within one mile of the city limits.

5373. Can you give any details to show where the meat came from that was inferior?—Well, now, I was not there. I was not engaged in that business to inquire where it came from, but I know it was shipped from somewhere, and it was so inferior that the people objected to it.

5374. Are you aware that the trade in dead meat from Chicago towards the eastern parts of the United States has rapidly increased during the last five years?—No, I am not. I do not think it has either; it might in certain cities. Take Boston and those places where they cannot grow cattle at all, they have no advantage of pastures; perhaps it might be when you go further east; so far as Baltimore and New York city, I do not think it.

5375. Is it within your own knowledge, as to New York city, that there has not been an increase from Chicago?—I think not.

5376. Suppose we have a return from the United States Council that it has, can you deny that?—So far as the United States Council, that does not apply at all; you have to refer to the commissioners appointed by the authorities of New York city.

5377. I refer to a document from the Agricultural Bureau of the United States?—That is not always correct; in order to get a correct statement you have to refer to persons appointed by the authorities of New York city. You people here take the agricultural statistics, but they are

J. R. Willing,
continued,
18th Sept. 1888.

not always to be relied on, and, though you might think you are right in relying on them, you will find out by examination that you are quite wrong. New York city is this way—there are a great many people think they do not have the finest meat in the world, but they do, and they pay for it. There are people that never pay less than 40 cents, that is 1s. 8d. a lb. Mr. Vanderbilt pays his cook 10,000 dollars a year.

5378. It is reported to us that for a term of years, up to 1885-6, the number of cattle that passed in a live state from Chicago to New York greatly diminished, and that there was a very large increase in the amount of dead meat carried from Chicago to New York—are you prepared to say that such statement is inaccurate?—Now you gentlemen here figure that New York is the only city in the United States.

5379. I can refer to other cities?—Baltimore is the fifth city in the United States, and so far as the good meat is concerned in New York city, they are slaughtered at the abattoirs in New York city, and that in Fulton National Market. That is where all the good meat is served to the aristocracy; those people pay for it regardless of the price.

5380. Is it within your own knowledge where this meat in the best market for the wealthy families is obtained?—Yes; it is slaughtered within five miles of the city.

5381. Where is it grown?—I cannot say.

5382. Is it American grown beef?—It is beef that is shipped there as live cattle—American; not shipped as foreign, because we cannot ship foreign. But those people are good butchers; they serve the best people; they have their own paddocks, and buy those cattle, and put them on a farm, and they are brought from the farms as every man calls for them.

5383. How long did you reside in New York?—Twelve months. I served in the legislature of Maryland in 1884.

5384. Did you frequently visit those abattoirs in New York?—Yes. You can go to Portland, Oregon, that is the extreme west of the United States, and ask the butchers there, the men engaged there; they buy the cattle, and put them on their own farms.

5385. They pasture them before killing, and get a higher price?—And they ship them to New York city before they kill them, and the poorest they kill for local consumption. In New York city there are people that pay 40 cents a lb.; now, the only object of people that have engaged in that business is to get an outlet for the inferior beef, and it is sold very low, because of the high price for the other.

5386. Then in America the rich feed the poor?—They do, and I think they do the same here.

5387. Are you familiar with the mode of conducting abattoirs?—Yes, I know something about Baltimore City abattoirs; we there compel all cattle to be sent to one general abattoir to be slaughtered, but first they pass an inspection by what we call a live-stock inspector, to see that they are in a proper condition to be slaughtered; after that they pass the dead-meat inspector, who, if he thinks the meat is not in a proper condition to be served to people, condemns it, and then he pours kerosene over it all, and so condemns it, because after he passed away it might be used. He has a man with kerosene to make it unfit for use.

5388. What do they do with it then?—They can boil it down, but so far as being eaten it is useless.

5389. How are the inspectors appointed for the live-stock and dead-meat market?—By the Government.

5390. Have you read any articles in the local papers describing the method of killing in America?—Not at all. I am only prepared to verify what I state before you.

5391. If you had read those articles you could say whether they were correct?—I have not read them.

5392. You have seen the killing places in Chicago?—Yes.

5393. Do you think they are well conducted?—I do not. I have seen cattle driven out of the cars that could scarcely stand to be killed.

5394. They were in a bad state of health?—I think so. I think you would say that any cattle that could hardly stand to be driven off the cars were not healthy.

5395. Would those inspectors you refer to see those cattle were not fit to be killed and condemn them?—I am not referring to the inspector of Chicago. You understand, the Constitution of the United States requires that every State shall make a law complying with the Constitution of the United States. Take the city of Baltimore; we had, at the last census, 420,000 inhabitants, now it is 600,000; the State of Maryland has to make her laws agreeable to the Constitution of the United States, and Baltimore has to make her laws agreeable to the Constitution of Maryland, and if they want a loan we have to pass an Act called an Enabling Act.

5396. What area does the city of Baltimore occupy?—Five miles square.

5397. I understand that their killing operations are conducted at one central abattoir?—Yes.

5398. And no private abattoirs are allowed?—No.

5399. About one mile from the limits of the city?—Yes.

5400. Is it within your knowledge whether inconvenience arises from the confining of trade to the one abattoir for so large a city?—That might be; I cannot say about that, because if you take a butcher that has been engaged in the business, who, perhaps has his own private arrangements for killing, he might make an objection. Naturally he would; but, as a rule, I think, it is a general convenience to the city; I mean the general interests of the city. People with their killing and cooling arrangements might object, but for the best interests of all concerned we have come to the conclusion that one abattoir is the best.

5401. Do I understand you to say that private butchers have a chance of slaughtering on their own account?—No, they are not allowed; that is where I say the objection arises to that, the butchers with their own private places fitted up object; but the people as a whole think that it is to the general interest of the people to have a general abattoir.

5402. Are you familiar with the abattoirs here, the little time you have been here?—No.

5403. Do you think, from the mode of conducting abattoirs in America, we have much to learn—are they well conducted?—I think this much, that the inspector is much more competent to judge when he sees cattle on the hoof, in a live state, than when the meat is killed. I do not know, of course, but I think that you or I, if we were inspectors and saw cattle on the hoof, we should be more competent judges of the condition than to see the quarters of beef after it is killed.

5404. What was the reason this State passed this law to have the abattoirs not more than five miles from the city?—Because there were meats coming into the city that were considered unfit for use, and the labouring class of people did not look at quality but at price; and if they went to one shop where the price was less than another, while the shop that was charging more was the cheapest meat as regards health, they did not look at that, and in consequence of that we said we should have to protect them, and make some provision against such things being done. The only way was to see that the meat was to be slaughtered within five miles of the city.

5405. Was it found that the meat slaughtered beyond five miles of the city was not so good?—That was why they passed the law, otherwise they would not have passed it at all.

5406. Was it from the driving of the cattle or bringing the carcasses of the cattle a long distance?—No, it was just this—that the carcasses of the cattle that were killed a long distance were placed in those shops for sale, and they were in an unfit condition to be sold to the public, the consequence was that the State passed that law I speak of. Now, it is a well-known fact that in the States a man goes out into the western countries and buys a herd of cattle, may be of 10,000 or 20,000; out of that 20,000 there may be 5,000 that are inferior cattle, useless, unfit, unhealthy for people to consume, and he brings them into the slaughter-house and kills the whole of them; it is exposed in the market, and there comes along a labouring man who needs to be protected, and he will ask him 3d. a pound for beef, the next man will ask 6d. or 5d. or 4d. As a result, the poor labouring man says, "I can get this for 3d.;" he does not know of the quality, and does not know of the injury to health, and buys that at 3d. a pound.

5407. Why cannot the inspector of the dead-meat market condemn those?—Because the inspector of the live market knows more about the condition of the meat than the inspector of the dead meat.

5408. The man who actually sees the meat?—Yes; suppose I am in the butchering business. I have in my stock-ranch a certain cattle; he is in fine health to-day, in a week from now he may have the pleuro-pneumonia; but the disease has not affected his condition. I go to work as a business man, and slaughter him then and there—why? because his dead meat shows up well to the market, but I know in my own mind, as a butcher, that that animal is not in a healthy state; I do not propose to keep it till you and every one else knows it. You take your inspector of dead meat, and he looks at that, and he says "It is pretty fair meat," and sees no reason not to use it; but if the same cattle was brought alive he would say "No, you cannot kill that, because it is not in proper condition." You know such things are the case.

5409. The whole thing comes to this, that, in your opinion, the meat ought to be inspected whilst it is alive?—Yes.

5410. And the consequence is that those States insist on its being brought in alive?—That is quite right.

The witness withdrew.

William Henry Prohasky, sworn and examined.

5411. *By the Commission.*—You are the mayor of the town of Port Melbourne?—Yes.

5412. How long have you been resident in that district?—About eight years.

W. H. Prohasky,
18th Sept. 1888.

5413. Are you familiar with the condition of the Port Melbourne abattoirs?—Yes, fairly well, by repeated visits.

5414. Do you think the present condition of them is satisfactory?—With one or two exceptions, I think very satisfactory.

5415. What are the exceptions?—The exception I should say particularly is as to the drainage from the abattoirs.

5416. What is the defect in connexion with the drainage?—It arises principally from some land that has been taken possession of by the Harbour Trust, adjoining the abattoirs. Formerly we had about six acres. Now we have only about two and a half acres. The remaining three acres and a half have been taken by the Harbour Trust. The drainage, which was formerly regarded as somewhat stationary, has been blocked by the Harbour Trust.

5417. Is it within your own knowledge that the operations of the Harbour Trust have introduced any new difficulties as to drainage of the abattoirs?—Yes. Formerly we had a very clear drainage of it into the river; but since the Harbour Trust have commenced operations near the abattoirs, they have constructed a drain which fails to carry it away from the abattoirs in any way satisfactorily.

5418. In your opinion, is the condition of the drains near the abattoirs satisfactory?—Yes.

5419. In your opinion, is the building of the abattoirs fit for the purpose?—Yes.

5420. In your opinion, are the general levels of the land, independently of the operations of the Harbour Trust, such as to fit the site to be the site of an abattoir?—Yes. Prior to the com-

W. H. Prohasky, commencement of the operations of the Harbour Trust, no complaint was ever made by the health officer of the district as to the drainage or other sanitary arrangements.

5421. What is the tenure under which the present holder of the abattoirs holds?—The present holder of the abattoirs holds them from the council under a three years' tenure, as a lease. We hold them, of course, under ground lease of occupancy from the Board of Land and Works. We let on public contract, and the present contract is £100 a year for the right to use them.

5422. Do you think the way he conducts operations within the abattoirs is satisfactory?—Quite so, to the general public of Port Melbourne, as far as I have been able to gather.

5423. Do you speak from your own experience?—From that, and from the butchers, and those who have business at the abattoirs.

5424. Do you think that the district of Port Melbourne could be supplied wholly from the Metropolitan Abattoirs and the Metropolitan Meatmarket, without inconvenience to the inhabitants?—I think they could be supplied without very great difficulty, although I consider the local abattoirs is a great convenience to local butchers. Of course, they could be supplied by the metropolitan abattoirs without very great difficulty.

5425. In your opinion, supposing that the convenience of the butchers renders it necessary that there should be an abattoir for the district south of the river, would it be better to have one large abattoir, meeting the requirements of several districts, or to continue the present system of having several abattoirs, one in each municipality?—The opinion expressed in conference of the various municipalities on the south side of the Yarra, including our own, is that it is better to have a south suburban abattoir, at which the municipalities on the south side of the river could be supplied from one abattoir.

5426. In the opinion of your council, it would be better to have one large southern abattoir than to do away with the whole system of abattoirs?—That is the present expressed opinion of the council, as far as I know it.

5427. Do you concur in that opinion?—I do.

5428. Is there anything else you would like to mention?—Nothing, except to say that I think that some supervision should be exercised by the Government or the Central Board of Health by which meat could be inspected before it went out. I consider that the dead meat can be better inspected than live meat as to whether it is fit.

5429. Have you had experience that leads you to speak confidently?—That is my opinion, and I think that inspectors ought to be appointed to inspect those bodies before they go out for human consumption.

5430. Would the various municipalities south of the river, if one central abattoir were approved, join in appointing an inspector?—I think there would be no difficulty. I think our council have recommended to Mr. Dow that an inspector should be appointed to inspect all meat before it leaves the abattoir.

5431. Would it be better that he should be appointed by the local council or by the Central Board of Health?—I think he should be appointed by the Central Board of Health, and apart from local interests altogether.

The witness withdrew.

Edward Clark sworn and examined.

Edward Clark,
18th Sept. 1888.

5432. *By the Commission.*—What is your address?—Town Hall, Port Melbourne.

5433. You are the Town Clerk of the Borough of Port Melbourne?—Yes.

5434. How long have you acted in that capacity?—Twenty-eight years.

5435. Have you heard the evidence of the Mayor of Port Melbourne?—Yes.

5436. Do you concur in the opinion which he has stated?—Yes.

5437. Do you desire to add anything to the statements which he has made, either concerning the present state of the Port Melbourne abattoirs, or concerning the policy which should be followed, in regard to the meat trade of the southern metropolitan districts?—No, I have no opinion to express on the subject. I have facts, if the Commission wishes to know them. There is the question of the drainage for one thing in connexion with the abattoirs. Before this building was erected, a drain had been cut by the council for the drainage of the flat running past the land where the abattoirs now stand, and when the Government were filling up land they obliterated our drain, causing a considerable inconvenience to the locality, and the Harbour Trust have since that time also interfered with that drain. The consequence is that the drainage from the abattoirs is not so free as it used to be, and the difficulty has been created, not by the municipality, but by the Government and the Harbour Trust.

5438. Where does it flow into?—Into the river.

5439. Will you describe the drain that leads from the abattoirs down to the river, in part directly under the control of the municipality?—It is an open drain that runs at the back of the ground, and, as far as I know, of red-gum timber.

5440. Is it straight, or has it bends in it?—That I could not say.

5441. Is there a sufficient fall in that wooden drain to carry off the blood rapidly?—As far as I know there is.

5442. Have you satisfied yourself by personal examination whether that drain frequently overflows?—I have not seen the drain for a long time past, therefore I cannot say.

5443. Does that drain pass through a pig-yard?—No. It is right at the back of the premises, right away.

5444. Are you able to say that the drain does not pass through a yard where pigs are habitually kept?—The drain I speak of is outside the fence.

5445. I refer to the main drain from the abattoirs that leads to the river?—There is the drainage from the abattoirs. I have a plan that will show the position of the abattoir itself—*[exhibiting and explaining a plan]*.

5446. My question was whether you were able to state whether that drain, the main drain from the abattoirs, conveying blood to the river, passed through the yard in which pigs were kept?—Not that I know of.

5447. Pigs are kept at your abattoirs?—They used to be.

5448. Are they not now?—I am not aware. I have not been down there for a long time.

5449. Have people permission to keep them?—In that direction, yes. There is a bye-law in the borough prohibiting the keeping of swine except within certain limits, and this area where the abattoirs stands is within the limits in which people may keep pigs.

5450. But the corporation could prohibit the keeping of pigs at the abattoirs if they thought proper?—Yes.

5451. Are there any gratings in the drains leading from the abattoirs, so as to prevent the thick blood passing to the river?—That I could not say. The inspector of nuisances could say that.

5452. Do you think the flooring within the killing-house is satisfactory?—The last time I saw it it was. It was well washed and grouted, and the matter was flowing down freely then. It was a long time ago.

5453. It was noted by the Commission that there were some crevices five inches deep between the pitchers—have you sufficient knowledge to contradict that statement?—No.

5454. Can you say, from your own observation, whether there is a sufficient fall in the sheep-killing place towards the outlet drain?—I have always been given to understand so, but I could not state so of my own knowledge.

5455. Have you any pits at the abattoirs for the collection of the crude blood?—I could not say.

5456. Have you visited the boiling-down place close to the abattoirs?—I have not been in that direction for the last two years.

5457. Could you state whether the condition of that boiling-down place is distinctly offensive?—My recollection of it was that it was not very pleasant.

5458. Why should not that condition of things be remedied?—There is nothing to prevent it. If we get a report from the inspector of nuisances the local board of health immediately acts on that, and if there was any complaint the local board of health would immediately deal with it.

5459. The inspector of nuisances is your own servant?—Yes, he is paid by the council.

5460. We noticed in our visit that the floor was earth, with blood thick in it, and an offensive boiling-down smell in the place?—That is possible.

5461. Do you think the slaughter-yards are satisfactory in connexion with the abattoirs?—I could not say.

5462. Is there any shelter for the animals?—I could not say.

5463. Is there any drain leading from the yards in which cattle are kept?—Not according to this plan. I could not say of my own knowledge.

5464. We noted on our visit that pigs were wandering over the whole place, and feeding on the blood and offal lying about. Are you able to say whether that is the habitual condition of things?—Some years ago there was a report of that kind, but we have been given to understand for a long time past that that had been remedied. We have had no report to that effect.

5465. Is it the inspector of nuisances that gives you to understand it has been remedied, or general hearsay?—The report of the inspector of nuisances and the report from Mr. Taylor, the inspector of the Central Board of Health. We have a report of his, in which he states that the place was satisfactory—one of his latest reports.

5466. We noticed that the closets were in a filthy condition—excreta and paper above the level of the seat, and no earth used?—That is inexcusable. We have a system as to that kind of thing, and there should be no abuse of that sort existing. It is merely for the keeper of the abattoirs to send an order to the contractor, and he would attend to the whole thing.

5467. What is the revenue total you derive?—£100 a year.

5468. What fees does this man get for killing sheep, or cattle, or pigs, in the gross?—I do not know. We do not interfere with his business.

5469. Are there regular periodical inspections made?—The inspector of nuisances and the health officer go down there occasionally, but at no stated period.

5470. Is there no rule that those premises shall be inspected at least so many times in the year?—No.

5471. Did the council erect the premises and lease them?—Yes, we have spent over £2,000, up to the date of the last annual balance, upon those abattoirs.

5472. There is practically no supervision?—Except by the inspector of nuisances, and Dr. Smythe.

5473. Do you desire to make any further statements to the Commission touching the matter of abattoirs or noxious trades?—This idea of a southern abattoir has been discussed in conference between the councils of St. Kilda and Emerald Hill and Sandridge, and after some time St. Kilda dropped out of it, and then it was left simply to South Melbourne and Port Melbourne, and efforts have been made to induce the Government to set apart a large area of land in the Bend near the Williamstown ferry across the Yarra, but the Williamstown people have opposed it.

Edward Clark,
continued,
18th Sept. 1888.

5474. Do you think that serious inconvenience would arise to the inhabitants of Port Melbourne if the local abattoirs were abolished?—The chief inconvenience would be to the butchers, many of whom are interested in supplying the ships. On the occasion of a deputation to Mr. Dow, a number of shipping butchers attended, and they all stated the inconvenience they would be put to if the abattoirs were taken away from the locality altogether. In many instances, they have to attend in the early morning, at two or three o'clock, to supply meat to the ships, and if the local abattoirs were abolished they would suffer serious inconvenience, and perhaps not be able to supply the ships.

5475. Is there any further matter?—Nothing else.

The witness withdrew.

Octavius Frederick William Palmer sworn and examined.

O. F. W. Palmer,
18th Sept. 1888.

5476. *By the Commission.*—What is your address?—Warrnambool.

5477. What is your occupation?—A grazier.

5478. You are at present, I believe, about to commence, or have commenced, operations for the slaughtering of stock in the country?—We are trying to organize a business of that sort, and intend to put up abattoirs in different portions of the colony.

5479. What are the chief difficulties which you meet with in the attempt to establish this industry?—We have not met with any at present. Of course, we have not brought any meat to the market yet.

5480. Have you, in any one particular site, made progress in the erection of the necessary work?—Yes, we have done so in two—Terang and Wangaratta.

5481. Do you propose to carry on your operations during the whole year?—I think the whole year; we hope so.

5482. How do you propose to provide for the conveyance and storage of meat?—We are putting up a chill chamber in Melbourne, near the railway, and a depôt for the disposal of meat, and a chill chamber also in case of hot weather. Of course, it is a new business, and we will have to learn as we go along to a certain extent. It is a new business so far as sending meat from the country districts into town is concerned, but I have very little doubt of success myself.

5483. Have your negotiations with the Railway department been satisfactory?—Exceedingly so. I must say the Railway Commissioners have done all we have asked them.

5484. Are your arrangements such that you will be able to transfer the meat from the slaughtering-places, through the train, to your depôt in town with the minimum of handling?—I think so; totally different from what they now get. I hope so.

5485. Have you any objection to state the main lines on which the business will be conducted?—No; in the first instance, it will be on the North-Eastern line, and then we would be guided entirely by the supply of cattle in the other districts. If we find them at a high price in one district we will move our whole men and appliances, all except the abattoirs, to another district, and then kill there.

5486. Do you think that the fact that you could not get a constant supply of stock at low prices in any one district would prevent success from being obtained?—Of course, there are fat cattle in all districts, and we want to guard against such a thing as buying up all the fat cattle in the district, which might happen, so as to close us up. We also want to guard against seasons. Sometimes there is a drought in some places and sometimes in others. Now there is a drought at Wangaratta, and in our district there is any amount of rain.

5487. Would the fact of having to keep several different establishments going be prohibitive to the success of your undertaking?—I do not think so, nor would any one establishment be closed unless we desired to. There might be two or three months when we might close it.

5488. Do you propose to have extensive pasture lands?—We have already bought 1,000 acres and 500 acres in two places, and also secured the right of leasing land to put cattle on.

5489. Have you determined on any system of resting cattle before killing? We have studied that to a great extent. Some years ago I was occupied in this matter. My brother and myself owned a station in the north-east, and came to a dead-lock with all the butchers. We started a butchering establishment for four or five years.

5490. Why did you cease that time?—Some of the butchers bought us out; they were brought to terms. They would not give us terms that we thought fair for our cattle, and we started an establishment at Yackandandah.

5491. Were your operations satisfactory?—Of course, we soon killed all our own cattle, and bought largely from our neighbours.

5492. What outlet have you there?—The diggings of Buckland and Yackandandah, and not the metropolitan market at all.

5493. Subsequently to that, what have you done?—I made inquiries as to the best method of killing cattle—under what circumstances they were most advantageously killed for consumption—and I found that they ought not to fast more than twelve or twenty-four hours at the very longest; after that time they got feverish for the want of food, and that altered the quality of the meat. There is not the same sap, the technical term, juice or gravy, when the beast becomes feverish; it alters the consistency of it, injures the meat to a great extent, so that it is not palatable. The gravy is totally different in a beast killed in the early stage, before it becomes feverish and after it becomes excited, and that is the reason why meat is so bad in town compared to what it is in the country districts.

5494. To what do you attribute the feverish condition?—Starvation and excitement. In several instances on the station, when we were short of meat, we ran a beast in; galloped it a few miles, and killed him right off, and he would not be fit to eat hardly. O. F. W. Palmer,
continued,
18th Sept. 1888.

5495. What is your usual manner of killing?—Let them stand from six to twelve hours in the yard before killing, and drive them in as quietly as driving a cow.

5496. Would you be able to kill cattle in the same condition of quietness for the Metropolitan Market?—Yes, perhaps not quite so perfectly. Of course, the method of putting cattle into the abattoirs is wrong in Melbourne and Glebe Island, poking them with a pithing iron and sticks, whereas with the very least thought they could construct yards so that they could put them in as easily as riding a horse across the street.

5497. You think you will be able to attain that?—Yes, I have studied the matter a good deal, and know I could do it. I could show them the way here, totally different. Glebe Island is worse than here.

5498. Your yards would be differently constructed?—Yes, I have seen them a quarter of an hour putting cattle in.

5499. Have you begun business at Wangaratta or Terang?—No, we are getting the machinery in now.

5500. You propose to have chill rooms up there?—I am not quite sure about that, because I fancy, unless it is properly chilled, it is injurious for meat to be confined in compressed air. They bring it in in Sydney, a man named Richards, in open trucks.

5501. He has only 30 miles to bring it?—I thought it was 45, but the climate is very different from this.

5502. Have the Railway Commissioners promised to provide trucks of a proper sort?—They have a truck under construction now, which I think will suit. The Commissioners are meeting us in every way.

5503. You expect to get your meat down to Melbourne in summer by railway without chilling?—I think so, if we can set it, not chill it. It is objectionable to chill it, it goes bad so soon.

5504. You mean not to freeze it?—I mean to get it set. I do not know what the method will be.

5505. In New South Wales the evidence was that on flat country you could not bring meat in in summer more than 50 miles?—Very likely not. I was there when the weather was muggy, and still they were bringing it in.

5506. Do you mean to sell through the meat market?—No; have a separate business of our own.

5507. You propose to conduct it something on the line of Richards, in Sydney?—Yes. I think it is most detrimental to beef, as it is here, handling it so much. I know nothing about the sanitary matters; my brother has been boiling down and bone crushing, and has his own ideas about the matter.

5508. Do you think you will have any difficulty, from a commercial stand-point, in regard to dealing with the hides and matters of that kind?—Not in the slightest; I have had any amount of applications to take all hides and tallow from us.

5509. The cost of having all your cooperage done up the country, the cost of having salt sent up, will that materially incommode you?—I think we can meet that by the number of cattle we can put in a truck, sixteen, with a certain number of sheep, whereas they only carry about nine beasts now.

5510. You think the extra carriage with the dead meat will more than make up for the cost of carrying all your extra materials—salt, and casks, and so on?—Yes, I think so.

5511. Are you making provision for desiccating blood and so on, so as not to be a nuisance?—We will take precautions to use the offal in a way that will not affect the meat or be a nuisance to the district; for our own interests we will not allow it to be a nuisance.

5512. The Sydney Meat Preserving Company make a considerable profit out of their system of desiccating?—Yes, I think we know in what way best to utilize it. We have our own idea on it; but I think the great profit will be the superior quality of the meat, which the public will appreciate.

5513. You spoke of the method here of getting the beasts into the abattoirs—was that in the city abattoirs?—Yes.

5514. I understand you considered that that process of forcing the beasts and so on was not the right one?—Yes; butchers are not the most gentle people in the world.

5515. You consider that actually interferes with the quality of the meat?—Yes.

5516. It puts the beast in a state of fever?—Yes, and, independently of that, it is the starvation before that; standing in the hot sun in the summer is very detrimental to the quality of the meat. At Wangaratta, we have trees around the yards, which the cattle will be able to stand under for the few hours we want them to fast before killing.

5517. Does not Melbourne supply the best meat that we have anywhere?—I think if you came down to the west, and ate a steak at Camperdown, or a roast at Terang, you would alter your opinion.

5518. Does not it possess the reputation of that?—It does from certain pastures—from Gippsland and from the west there is very fine meat—but I must say the cattle I saw Mr. Richards kill when I was up there were as fine as I ever saw in my life. It did not set as it ought, because it was very muggy weather.

O. F. W. Palmer,
continued,
18th Sept. 1888.

5519. Would you be surprised to hear that the people of Sydney think the Melbourne meat infinitely superior?—No, because I know that New South Wales suffers from climatic causes, but I know that the western district meat, Black's, Manifold's, Simpson's, and Kilmany Park and Tyson's at Gippsland, cannot be beaten.

5520. I have eaten meat at Warrnambool and other places, and did not discover that it was better than the Melbourne?—You must be very fortunate in your butcher. I think they lose sight of one thing in reference to cattle brought to Melbourne. I saw Copenhagen abattoirs quoted as not being the least objectionable, and the meat being good, but there the cattle are all stall fed. Here they are wild, and never handled till they are branded and put in the cattle yard. The well-bred cattle are wilder than scrubbers, and they soon get excited, and the excitement and starvation and sun is what damages the meat.

5521. Do you think the slaughter-houses in the country districts are properly conducted?—A few of them want looking after—not on sanitary grounds.

5522. I mean from the stand-point of exciting the beasts?—No; of course, there are not the number that are killed in the abattoirs in Melbourne; at the same time the abattoirs might be so constructed that they could get the cattle into the slaughter-rooms with a minimum of trouble to what they do now. I could go down and give them a plan that would put them in with the greatest ease.

5523. As to meat killed in Melbourne and meat killed in the country, is it not a fact that meat in Melbourne is hung considerably longer?—Still, if the meat was brought from the country districts, I do not see why they should not hang it. It is more the beast being excited that injures the quality of the meat. The butchers, perhaps, do not think of it, and people in Melbourne who are not practically acquainted with it cannot think of it, but of course I have seen a good deal of it, and know the reason.

5524. Do you propose to have the arrangements for the transfer of meat from your killing-places to the cars, and from the cars to your town dépôt, somewhat on the plan of the arrangements of the Darling Harbour?—No; on the same plan as Richards's, and getting waggons constructed exactly on his plan. The railway brings our meat right into our dépôt, so there will be no handling at all, only from the dépôt to the shops.

5525. And that you have imported special meat vans for?—Yes. I do not know what the business may develop into. I think what ought to be done would be for the butchers to buy cattle in the country districts, and get them slaughtered by us or any one that has a slaughtering establishment.

5526. Would such a system, with a large number of buying places, give satisfaction to the sellers of cattle?—Yes, I think most of the settlers are in favour of it, because they know the way their cattle are knocked about, and the loss must come on the producers when there is damage in the truck. I have known, out of 30 brought down in the trucks, one lost in each truck; that was £30; that was unusual. I saw three store cattle killed the other day.

5527. In your own experience, have the losses been very great?—They are considerable to settlers, and of course bruised meat is very bad, but that is not so much as its unfitness for consumption when it is feverish.

5528. It is not the actual bruising so much as the feverish condition from the knocking about and the excitement?—Yes.

5529. And you would have no objection in informing the Commission at any time as to this plan of getting beasts into the slaughter-yards?—I would do it with pleasure. If they are going to put up improvements at the abattoirs, I will give my ideas as a practical man. It is perfectly immaterial to us whether they move the abattoirs or not.

5530. Is your plan of bringing the cattle into the yards anything like that adopted by Richards Brothers?—I do not think his plan is perfect. He says himself that his business has increased, so that he has added from time to time, and he would like to pull down and re-construct, but I must say his cattle die very quietly, and bright in colour.

5531. His principle is simply to have the drive narrowing towards his killing place?—Yes.

5532. Is yours on that principle?—Yes, with some modifications. If you have noticed the abattoirs in Melbourne, they are on a broad basis—[*The witness illustrated by a sketch*]. I wonder how they have carried on so long that way. The cattle will not go in. I have seen them let eight into an enclosure and let four out, and the four go over the bodies of those dropped by the pithing iron, and the four object to it very much when again driven in.

5533. As to the mode of slaughtering—do you think pithing is better than shooting?—I could not tell you; I think there is very little difference. A man that is an expert at pithing will never make a mistake.

5534. They shoot them at Auburn, New South Wales?—I did not know that. We always shoot them on the station. Skilled men will quite easily get all the blood out. We have always found it easy enough.

5535. Do I understand that you do not intend to use any chilling process with this meat?—I cannot tell you; we have got to learn as we run.

5536. I understood you to say you waited till the meat was set?—Yes.

5537. And you objected to the chilling because the meat went bad?—Yes, soon after thawing.

5538. Have you had any experience of chilling down to 40°, as contrasted with freezing?—No; but I should say that 40° would be much better than freezing. Often, on the Murray, the thermometer would be down to 40°, and it did not injure the meat at all; but I mean meat in chill-rooms, 32° or 35° when taken out, goes bad very soon.

5539. Are the so-called chill-rooms here really freezing down below 32° ?—Yes, I have seen Bennett's, which is almost frozen.

5540. We have been told, in evidence, that meat which has been chilled—that is, not frozen, but chilled at 40° for 24 hours—may then be exposed for two or three days in hot weather without showing signs of going bad?—I think that is quite possible. I only speak from limited knowledge of that. All this winter we would not have had the least trouble in bringing the meat down. I think for eight months in the year it will be quite easy to bring meat from the main centres without any artificial process—from Gippsland, from the west, and north-east, Wangaratta.

5541. You spoke just now of moving your staff when meat became scarce in one district?—Yes.

5542. You would keep up several establishments?—We would keep the establishments ready for killing. Suppose I had 1,000 head of cattle in the west—Terang—I could add another 1,000 to those and commence at Wangaratta. It would be no trouble to take the men up by rail.

5543. Would it not entail a loss keeping the places without work going on?—It would only need a caretaker.

5544. And you would have a considerable quantity of land at each place?—We would take care we did not lose on that. I cannot speak of the exact details; there would be a very small amount of money lying idle for that.

The witness withdrew.

Thomas McLeod Palmer sworn and examined.

5545. *By the Commission.*—What are you?—I am a grazier, residing near Warrnambool.

5546. On what particular subject do you desire to give evidence before the Commission?—

T. M. Palmer,
18th Sept. 1888.

My experience as to the refuse from the boiling-down establishments or the slaughter-yard being injurious to health. It is simply my experience.

5547. Will you state your experience?—I have been extensively engaged, besides grazing in a boiling-down establishment for 20 years. I was the first to start the boiling-down in 1868, when the price of sheep came down. Since that time I have put through some hundreds of thousands of sheep, and have constantly had a bone-crushing place ever since, buying all the bones I could and grinding them up for my own use. I am a very extensive employer of labour, and most of my men live within half-a-mile of the boiling-down establishment. The effluvium is certainly frequently unpleasant, but I think it is not injurious. The man who manages my boiling-down establishment has reared a family of seven children there, and there are not more healthy or strong children on the whole establishment than they. They have grown up within 50 yards of the boiling-down place.

5548. What distance is the boiling-down place from the nearest abattoirs?—About half-a-mile, I should think. But I have my own slaughter-house for sheep.

5549. How far is that away from where your boiling-down is conducted?—Close by, in my own private slaughter-yard. It is half-a-mile away.

5550. Is your boiling-down place in the country?—Yes.

5551. Plenty of fresh air in the neighbourhood?—Any amount.

5552. And are the carcasses you boil down fresh or putrid?—Generally fresh.

5553. Did you sometimes boil down carcasses that were tainted or putrid?—I did sometimes.

5554. Without producing any effluvium?—Of course the effluvium was unpleasant.

5555. Still under those circumstances, there was no actual injury to health?—Not the slightest.

5556. In what kind of vats do you boil?—Iron closed vats.

5557. Have you any steam-pipe leading down under the furnace?—A steam boiler. The steam-pipe went down through the top of the vat. Then the steam comes out through the bottom as in ordinary boiling-down establishments. I have two vats.

5558. In some of the vats, the steam which escapes is taken down underneath the furnace?—No, the steam that escaped would fly off at the safety-valve only; and in blowing off the steam I just open the safety-valve and the whole of the steam goes out.

5559. And when you empty the vats, is there much effluvium then?—You could not avoid a certain amount, more especially from the gravy which flows from the vat.

5560. Were there any other families besides this one in the immediate neighbourhood?—Not within half-a-mile. I live myself within half-a-mile of it.

5561. Have you never found that people coming to the neighbourhood, who were unaccustomed to that kind of atmosphere, suffered at first?—They would say it was very unpleasant, but I never knew any of them suffer from it.

5562. Not even loss of appetite?—Not a bit. I think it rather improves it, or perhaps they smell the sea-breeze.

5563. Have you any way of treating the gravy that comes away from the vats?—Put it on the land at once, and it used to smell most unpleasantly for a bit, but when the rain came it soon went. I put it on ploughed ground, if not on ordinary pasture, to improve it. At first it would burn up the grass, but in the course of a month or two the burnt appearance would disappear, and grass much improved.

5564. What did you do with the blood?—Either bury it, or feed store pigs on it.

5565. Do you think the pigs were injured by feeding on the blood?—Not in the slightest, as far as the growing, but I would not like to kill them that way. They would be put in sties and fattened on hard food for two or three months—peas and barley.

T. M. Palmer,
continued,
18th Sept. 1888.

5566. You think it is not injurious for them to be fed for a time on blood?—On the contrary, it improves them.

5567. You did not let them have it when fattening them?—No; all grain and whey. I have a very large dairy—the largest in Victoria. From that I get an immense amount of whey. That, mixed with the meal, fattens them very well.

5568. How far is the dairy from the boiling-down establishment?—About half-a-mile.

5569. Is it there you make your well-known cheese?—Yes.

5570. You get a higher price for it than any other cheese here?—I get the highest price of any one in the colonies, both here and Adelaide. This I attribute, in a great measure, to the amount of bone-dust I use on the pasture, making the pasture so rich; and, in laying it down, I mix bone-dust with the seed and harrow it in together.

5571. What number of stock do you kill?—Not any now.

5572. When you were in operation—what numbers?—I have done 3,000 sheep a week; but it was pretty hard work.

5573. Have you had much experience in the fattening of pigs for pork?—Yes; fattened thousands.

5574. Would you tell us whether meat is injurious to them, or what is the objection to giving them meat?—I think it makes the bacon soft; not the same firmness and hardness in it. That is what the bacon-curers complain of.

5575. Does it affect the colour?—I never tried it. I do not know. I have fed them only on it when they were young. I do not think it makes good pork. The butchers complain of it. The cooks say it fries away in the pan; nothing but fat left, so I have heard. We are always very careful.

5576. You have an objection to it; it has some effect?—Yes, it has the effect on me that the bacon-curers will not buy it, and they can tell it when they see the pigs in the yards.

5577. Are there any further matters you would like to make a statement on—on the subject of the meat trade?—I think my brother went into that so fully that I have nothing to add, except as to the experience of taking salt to Warrnambool. I think the hides could be sent down without salting. As to cooperage, I have had great experience of that, and that can be done just as cheaply in the country as in the towns. There is another matter also—ten years ago I was the first to start killing meat in the country districts for Melbourne; it was in Gippsland. I am now part owner of a property there, and we were compelled to give it up in consequence of the opposition we received here. I may state that we had not been bringing the meat into Melbourne above six weeks before the country-killed meat began to be inquired for, in consequence of its superiority; but many of the butchers here, of course, objected to it. The man who was selling for us was rather under the thumb of the butchers, and had to do as they told him. When my meat came in there, they would club together, put in three or four carcasses of beef, and sell it below what I could. If it was £1 a hundred, they would say, "Sell that at 14s.," and so shut me up; and I was not near the railway; I had to cart it a long way.

5578. Had you had a chilling-room they could not have put this pressure on?—That is what we think. We shall endeavour to avoid the rock we split on before.

5579. Do you generally concur in what your brother has said on the subject?—I do.

5580. Your killing in the country—how would that injure the butchers here?—Because they prefer the cattle coming here, and passing through their hands; and my meat was absolutely better than they could supply. The injury to the beast commences 24 hours after it has left the pasture by losing the sap, and the nourishment goes, and it gets hard and dies fiery red.

5581. I cannot see, if the butchers bought your meat—Do they get the cattle cheaper than they did your meat?—It was the wholesale butchers. The retail butchers would buy my meat. The former would oppose it.

5582. It was a case of trade opposition?—Yes.

5583. It was the salesmen more than the butchers?—No, the salesman was compelled to do what the wholesale men told him to do, because they were the larger men. It is very different from the old days. The Railway Commissioners meet us in every possible way now.

The witness withdrawn.

Adjourned to Tuesday next, at half-past Two o'clock.

TUESDAY, 25TH SEPTEMBER, 1888.

Present:

Professor H. B. ALLEN, in the Chair;

Clement Hodgkinson, Esq., C.E.,
Robert Reid, Esq.,
A. P. Akehurst, Esq.,

The Hon. J. Campbell,
Professor D. Orme Masson,
T. M. Girdlestone, Esq., F.R.C.S.

William John Ritchie Simpson sworn and examined.

W. J. R. Simpson
25th Sept. 1888.

5584. *By the Commission.*—What are your professional qualifications?—I am a Doctor of Medicine and Master of Surgery of Aberdeen University, and Diplomat of Public Health in the University of Cambridge.

5585. You are the health officer of the City of Calcutta?—Yes.

5586. How long have you held that appointment?—Two years and a half.

5587. What experience in health matters did you have prior to your appointment as health officer of the City of Calcutta?—I was medical officer of health for Aberdeen for five years. During that time, I acted as a temporary inspector for the Local Government Board of England for some two months. That was during the scare that had arisen about the possibility of the introduction of cholera. Cholera was present in France at the time.

5588. Subsequently, I believe, you proceeded to Egypt?—Before that time, I had proceeded to Egypt, where cholera was prevailing, and made some investigations there, which were reported to the Government, and put in the Parliamentary papers.

5589. By whom were you appointed health officer of Calcutta?—I was elected by the members of the Corporation.

5590. What is the nature of the Corporation at Calcutta?—The Corporation consists of the chairman and 60 members.

5591. Of those, I believe, about one in four are Europeans?—About that.

5592. Is that City Corporation of Calcutta practically the board of health for the district?—Yes.

5593. Are there any superior boards of health in India above the city boards?—Our sanitary administration in India is in a transitional state. Within the last few months, there have been formed provincial boards of health. India is divided into certain presidencies—three presidencies. Each of those is divided into certain provinces, and for each province a provincial board of health has been recently appointed. This board of health consists of the sanitary officer, who is a medical man, the sanitary engineer, and a civilian who has had experience in administrative work. All questions relating to health matters will be referred to them. If any new scheme is carried out by the local bodies in India, it will be sent to the Central Board for their approval.

5594. Which member will be chairman of such superior board of health?—The civilian, who is an experienced administrative officer.

5595. What rank in the service will such civilian hold?—A high rank, either as a magistrate or a commissioner of one of the districts. Those are the two highest appointments, until you get to the Lieutenant-Governor of a province. There are nine commissioners in the province of Bengal.

5596. Then I understand the chairman will be the officer second only in importance to the Governor of the district?—That is so.

5597. Is any provision made for legal assistance of those superior boards?—The civilian is usually a man who knows the law; but he will have his assistant for reference. He will be able to refer to the legal adviser of the Crown.

5598. What is the standing in India of the sanitary commissioner?—He has a high rank. At the present time, it is usually that of Deputy Surgeon-general in the army.

5599. Is it proposed to have any distinct legal relations between the superior boards of health and the city councils?—Yes, the provincial board of health is all-powerful. It will be able to control and direct the local councils. If the local councils do not carry out measures that are recommended, those measures will be carried out for them, and the expense charged to the local councils.

5600. Is there any other point touching the constitution of those superior boards of health that might be of value to us in our considerations?—The reason that those provincial boards of health were appointed was simply because the local councils would not act in sanitary matters; and the previous arrangement was only advising them to carry out certain arrangements, and they might leave them or do them; but now it has been found necessary to give the provincial board of health higher powers of control.

5601. How long has this provincial board of health been in existence?—An order for its formation came out in July last.

5602. Was it then formed?—It has been formed, I believe, since I left India.

5603. It is something quite new?—Yes; they found it quite impossible to get anything valuable done excepting in the larger towns, and even there there was great difficulty. In Calcutta, for instance, there had to be a Government inquiry on the sanitary condition of the town as late as 1884.

5604. Then this new board accounts for the transitional state you spoke of?—Yes; it has only recently been inaugurated.

5605. Will you next tell us, shortly, the nature of the abattoir arrangements in Calcutta?—Calcutta has one abattoir, some three miles away from the town.

5606. From the city limits?—Yes, from the boundary of the town. To this abattoir all the cattle or sheep and goats (mostly goats and sheep are killed in India) are taken as live stock, and they are there slaughtered under the superintendence of the superintendent, who is under the municipality. There they are marked by him as the different classes of meat, and then passed on to the metropolitan market, where the meat is sold; the metropolitan market is, of course, under the control of the local authorities, the town council.

5607. In that market, I suppose, the several classes of meat are kept strictly apart?—As far as possible. They are intended to be kept apart. I am afraid they are not always kept apart.

5608. In the retail places of business, is it customary for some sign to be put up indicating the class of meat which is there sold?—There are very few of those, and the custom is not to mark the meat.

W. J. R. Simpson
continued,
25th Sept. 1888.

5609. So that the retail buyer has to judge for himself what class of meat he is buying. Do the retail buyers buy in the market?—Mostly in the market, where it is marked; but there are a few places outside the market where it is not marked; but the great bulk of the sales take place in the market.

5610. Is there any system of inspection of the live stock prior to slaughtering?—Yes, the superintendent of the slaughter-houses has to inspect all the animals that are brought to the market; and he also, with the assistance of another man, sees them slaughtered, and if he sees anything wrong, he seizes it at once and has it destroyed. If there is any doubt, he refers the matter to the health officer.

5611. Is there any systematic examination of all carcases after killing, or are only those carcases examined which are indicated as suspicious by an examination of the live stock?—There is a cursory examination of all stock, but the chief examination is at the time of slaughtering.

5612. Is your staff large enough to provide even for a cursory examination of all classes?—Yes, there is the superintendent and his assistant.

5613. What sort of site are the abattoirs built on?—They are built away from any houses. The site of Calcutta consists of alluvial soil. The abattoirs are well constructed, well ventilated, with plenty of room, and well drained. They are well paved and the drainage runs immediately, about 10 feet from the abattoirs, into a large sewer which carries it away to a small creek into which the sewer runs, this creek going into the Sunderbunds, where no one lives, and finally reaching a large river that goes into the sea. All the blood and washings run into the drains at once. The offal is taken away immediately in a truck which is on a railway, and taken some three miles off, where it is given over to a man who boils it up. I might say they have a very large supply of water to those abattoirs. A special supply which keeps them clean and sweet.

5614. By whom was the establishment built?—It was built by the municipality under a very strong chairman, Sir Stewart Hogg, and he was very thorough in his work, and put up a very good building.

5615. Is it a municipal establishment exclusively?—Yes.

5616. I believe the chairman of the municipality has a very large personal power?—He is practically the municipality. There are three executive officers—the chairman, the health officer, and the engineer. They have the whole working of the municipality.

5617. Without going into the present system of dealing with house refuse at Calcutta, which I understand is not satisfactory, what is the system you propose to adopt in future?—I am considering the question of burning the house refuse. I have been in communication with Fryer for his destructor. I have seen the destructor in working order at Warrington, and was very pleased with it—with what I saw there; and, having read his papers, and knowing it has been introduced in London and Leeds and other places, I have every confidence in recommending it to the municipality of Calcutta.

5618. Since your arrival here, I believe, you have paid a rapid visit to the gathering grounds of our water supply?—Yes, on Friday afternoon and Saturday. On Friday afternoon I went up to see the Yan Yean Reservoir, and on Saturday I rode up the Australian Alps, and saw the Wallaby Creek and the Silver Creek, and saw the water being brought down there. I must say I was extremely satisfied with the whole arrangements. The forest land there, some 64,000 acres of land, I understand, is completely safe from any form of pollution, and I saw nothing that I could in any way say was unsafe. The only thing that I noticed was at the Yan Yean Reservoir itself; there is a piece of land there owned by a Mr. Burr; Burr's farm, I think it is called. It is laid out. It comes right down to within three chains of the reservoir, slopes down towards the reservoir, and at the present time is used for vineyards; but I believe, and I understand, that it is sold, and possibly may be laid out. Well, if this was laid out with houses, I do not see how it could be possibly avoided that there should be pollution into the Yan Yean Reservoir. Even apart from the laying out of it, if Mr. Burr manured that field, I think there would be danger of organic contamination. Otherwise, the reservoir and the whole gathering ground seemed to me to be as safe as one could very well wish.

5619. In your opinion, should analyses of the drinking water of Melbourne be performed regularly?—I think they should. I think it should be done, if not weekly, at least once a month, because it would be an index, for, if there was any addition to the impurity of the water on analysis, you would be able at once, by careful inspection, to see what had occurred—see where the pollution had occurred; but without the analysis you are working in the dark. You are supposing it is all right, without having any index to go by.

5620. What is the character of the analysis you would propose?—I think Wanklyn's is the best. The London waters are analysed by the Frankland process as well.

5621. You think the Wanklyn would be sufficient?—Yes.

5622. Would that admit of the detection of microscopical living organisms?—I mean for chemical purposes.

5623. Should a biological examination be made?—Yes, but it would need experience before any safe deduction could be made upon it.

5624. Could any such biological examination be well made by any inspector who was not habitually controlling a bacterial laboratory?—No.

5625. Among the native animals that exist here, there is a great prevalence of what is generally called hydatids. Would not that indicate the necessity for the examination of water, to see if any of the small objects are in it?—Yes; that would be microscopical examination. That is what is usually done in analyses. There is the chemical, the microscopical, and the biological.

5626. Whence is the water supply of Calcutta derived?—From the Hooghly, about 20 miles from Calcutta. It is one of the purest waters in the world.

5627. What precautions are taken in regard to analyses?—The analyses there are simply microscopical and chemical at the present time, the reason being that it was only just before I came that the bacterial laboratory had been put up. Dr. Koch visited India on his inquiry into cholera, and he examined the waters of the Hooghly, and pronounced them extremely satisfactory—found very few bacteria in them.

5628. Does not a portion of the water of the Ganges that flows past Benares get contaminated?—It is very unsatisfactory, and the Hooghly used to be one of the worst rivers. Benares is 1,000 miles away from Calcutta.

5629. I suppose there would be the pollution from the dead bodies, but the volume of water is so great that, by the time it reaches the Hooghly, it is purified?—Yes; at one time the Hooghly was polluted in the same way. It had all the night-soil and refuse thrown into it, and the bodies of the Hindoos. It was the custom to burn the bodies slightly, and throw them into the river; but those practices have been stopped, and, since the night-soil and the bodies being thrown in was stopped, we have had much less prevalence of cholera among the river population.

5630. Then, I presume, the experience in Calcutta goes to show that the river, in the course of a certain distance, purifies itself?—Yes, in long rivers of that large body; but a river like the Yarra, I am afraid, would never purify itself.

5631. Were any experiments made as to the time it takes for the purification of a river?—Not in Calcutta, but I believe it was done on the Seine, in Paris. I think it was found that within 20 miles it purified itself.

5632. Have you made inspection of the pipes in the reticulated area of Calcutta—the service-pipe in the water supply?—Yes.

5633. Have you found much trouble as to the choking in the pipes through the decomposition of vegetable matter?—No; we have a process of filtration before the water comes into the reticulation area. We have at present twelve, and there will be sixteen, large filter-beds through which the water passes. We have not had the slightest trouble, our only trouble is we have not had a sufficient supply.

5634. What are the filter-beds made of?—Coarse brick and coarse sand, and finer sand on the surface; a form of algæ or slime forms on the surface of the fine sand, and this is scraped off once a month.

5635. Do you think such filter-beds should be introduced in connexion with the Melbourne supply?—That is a question I am hardly able to answer, excepting that it struck me that your grids, the grids that are intended to stop any vegetable matter, are far too open. Now in Glasgow, where they do not use filtration, they bring the water from Loch Katrine by a tunnel, and then into a large reservoir for settling. At the end of this reservoir they have a very fine network of copper, I think, I am not quite sure of the material, but it is very fine network; and they find that quite sufficient to stop all those vegetable matters which are likely to decompose in the pipes.

5636. Have you examined the condition of any of the dairy farms in the Melbourne district?—Yes; I examined a number of them this morning, and found them in an extremely unsatisfactory condition. I inquired into the water supply, and found that it was right enough. They were supplied from the Yan Yean; that is, in the Northcote district. That was the only district I was able to visit; but the arrangements of the farmyards as to drainage, and the arrangements of the cowsheds as to drainage—there was no drainage at all; the whole place was in one seething mass of filth. I visited several places, and I found the same thing. I noticed also that none of them have dairies, separate rooms where they could keep the milk away from the cowsheds or away from near the manure heap. They all seemed to say—"Oh! we send the milk immediately into Melbourne, and do not require it."

5637. In those places you visited, you noticed there was no place where the milk could be kept away from contamination?—Yes. I understood from the inspector whom I went with that all the farmer had to do was to get registered, and that he did not require to send in an application to have his place licensed. Now, in other places, the cow-man has to send in an application to have his place licensed; then an inspector goes out and ascertains whether the drainage and water supply and the general arrangements are sanitary. If so, then he reports that fact to the local authority, and a licence is then given; but if the arrangements are not satisfactory, the licence is withheld until those arrangements are made. And I think that ought to be done in Melbourne, because—I do not know what it is in Australia, but I know what it is in Europe, and also in India—that much typhoid fever comes through the milk into towns. You may keep your town in a satisfactory condition, and yet, if you are having typhoid fever sent in, and drinking contaminated milk, you may be in as good a sanitary condition as you can be, but there you have the danger. That was specially marked in Glasgow, which does not dispose of its sewage very well. It has very fair sewerage throughout the town, but yet many epidemics have been traced to the farms outside supplying milk into Glasgow; and the same with a vast number of towns. A great many cases have been known.

5638. Have you any practical suggestion to make with regard to the better administration of dairy farms in and around Melbourne?—The difficulty would be to know under whose authority to put them; at the present time, I understand, you have a number of municipalities all round Melbourne; and it seems to me that those municipalities would have been better if they had been wards of one large town, with a large municipality, which would have the control of all sanitary matters. If you have it in that way, of course, the control of the dairies that supply the milk to the city of Melbourne would be under the large municipality.

W. J. R. Simpson
continued,
25th Sept. 1888.

5639. That means, practically, that you would put the health administration of our municipal districts under the control of a metropolitan municipal board?—Yes; I do not see how you can well do otherwise, especially in the matter of drainage; but I think all health matters—water supply, drainage, building regulations, the supply of meat, the supply of milk—should be under one authority, and that authority, whether you call it municipal authority or not, should be a central authority—a single authority. It has been the experience in most towns, that that is the only way in which any good can be got. We find that, in the towns in England, they are constantly trying to absorb all the little municipalities around them, to avoid this crippling of administration.

5640. It is found then that, where you have a number of little bodies around some larger bodies, the insanitary condition of the smaller bodies is a check to general advancement?—A great check to general advancement. The larger the body, the larger in all probability will be the measures that are taken for sanitary matters.

5641. I understand, also, that with a larger body there will be less risk of personal interest having weight in the administration?—Yes, that is very noticeable; and then it would be cheaper. At the present time, it seems to me, you have a town clerk for one place, a surveyor for the same, and so on. The administration of each individual suburb costs a very large sum of money, whereas, if they were all put together, you could have a large staff of officers at a cheaper rate. I do not mean the salaries cheaper, but the aggregate amount of salaries less. Great difficulty, in London, has been found in the vestry system, and it is urged that all these matters will be tackled by the central authority. In Calcutta, we have full control; we are taking in the suburbs; we found that the municipalities around did nothing.

5642. What population do you now deal with in Calcutta?—At present, we only deal with 450,000, but when we take in the suburbs we shall deal with about 800,000.

5643. Is it thought that any difficulty will arise in controlling all the health administration in the city and suburbs by one authority?—None whatever. When the suburbs are put in, the total number of members in the municipality will be 75, but, practically, it is in the hands of three men.

5644. You spoke of controlling the milk and meat supply—would you include other articles of food?—Those are the more prominent; but I would include the food supply generally.

5645. As to house refuse, you include that?—Yes, what they put out in a bucket.

5646. Passing on to the question of sewerage—what is your opinion of the present system prevailing in Melbourne?—It may seem rather invidious, my condemning the various things you have put forward, but, of course, when I condemn, there are many things I admire in Melbourne, as to the streets and so on. In regard to sewerage, I think that it is a very bad system that you have. I visited North Carlton yesterday with Dr. Jamieson, the health officer, and we went into a number of by-streets, little lanes, and saw the surface drainage coming down, perhaps, sometimes, over 150 yards in distance; well, the houses at the top of the hill are right enough, the healthiness of those is very fair, but as we got down towards the lower part of the hill, towards the foot, we found the houses were damp; there is scarcely a house that is dry, and one woman drew our attention, and asked us to go into one of the houses; she showed us some boots that she had cleaned just two or three days before, they were covered with mildew; the walls also were damp, and her husband was suffering from phthisis, and a case of typhoid fever had been taken away some little time before; now it is in the lower parts of the system that you get the increase of the sub-soil water, where you get a rise in the sub-soil water, and that, by-and-by, as in South Melbourne, will become a very serious matter; you get an accumulation of filth, and it cannot get away. South Melbourne, I understand (I was looking at the map), is only about seven feet above the level of the sea; this sub-soil water will continually rise, and it is from that, it is well-known, that all kinds of diseases arise, more especially malaria and typhoid. I do not think it is a matter of simply the removal of excreta; it is also a matter of removal of sewage water. I visited other parts of the town, and found it quite stagnant; it did not flow properly, if it did flow, in many places; very often the channels were broken, and you get soakage into the soil. It seems to me that it will ultimately become a very serious matter for Melbourne.

5647. Did you examine the general condition of the channels—the general construction of the channels in Melbourne?—Yes; they are made of bluestone pitchers, which are often not cemented, not sufficiently cemented. Of course, in many places, sinkages have taken place, and the result is stagnant pools; now in the broad streets that is right enough, in Bourke-street and Collins-street and all those, the drainage system there looks very well indeed at the higher parts of it; but then, as you get lower down, I understand, a large number of the houses are damp, and that is what we get in other places. I remember, in Aberdeen, we had a sewerage system right enough in nearly every part of the town excepting one portion, and that one portion had drains very much in the same way as you have in Melbourne; the result was, that the houses were damp, and that the people there suffered from peculiar febrile disease; it was half typhoid and half not typhoid, they hardly knew what it was; but it was distinctly typhoidal.

5648. There is just that same fever prevailing in Melbourne?—I used to be able to trace the epidemic of typhoid coming into Aberdeen on the higher grounds, where it was well drained; but in the damp district it was always there; as soon as the autumnal season came on, we had this peculiar fever there.

5649. Did that fever kill?—It did sometimes, but there there was a large number ill without dying; I dare say about one in twenty-five or so died—about 4 per cent.

5650. Did you ever get a *post mortem*?—I did not perform any.

5651. Did you ever hear of one being made in any case?—No, I do not think there was.

5652. I ask, because that fever is prevalent in Melbourne, and I have not heard of death from it, but it is certainly a source of great weakness?—It was in a fishing village, and they will not allow *post mortems*; there was a great prejudice against *post mortems* among the fishing population. The fever seems to last about three weeks or so, and sometimes six weeks. I made inquiries as to whether this same fever was here immediately I saw the condition of the back yards of the houses here. I might say that, in many of the back yards I visited this morning, I saw no drainage at all; it simply soaked into the ground. The slop waters ran into the yard, and there soaked down.

5653. What was the result of your inquiry as to the existence of fever?—I could not get any definite result; the only information I got was from Dr. Jamieson, and he said, "Oh yes, it is prevalent all over the place." We visited a number of houses where Dr. Jamieson said typhoid had been reported to him, and we found those same conditions. We found a row of houses at the bottom of the hill, and three streams of surface water came down upon them, soiled water, and it simply soaked into the ground and into the houses, and went up the walls of the houses.

5654. Have you visited any of the fields in the suburbs that have been newly built on?—I cannot say I have. I noticed some in passing. I noticed, especially in going out to Armadale, that a number of houses had been put up all in a row, and there were the pan closets immediately behind in the back yard, and then behind there was a sort of ditch which seemed to be stagnant, and, so far as I could see from the conformation of the ground there, all surface drainage must go down into this ditch, and thus lie stagnant, and must ferment and putrefy. I do not know what it is in the summer time, but I should think that it was extremely objectionable.

5655. You did not accurately examine the condition of things there?—No.

5656. What is your opinion of the present system of dealing with night-soil in Melbourne? All I can say is, it is an attempt at the pan-closet system.

5657. Why do you say an attempt at the pan-closet system?—Because it is about the crudest I have noticed.

5658. What should the pan system be if properly carried out?—The pan system, if properly carried out, should be, that one scavenger comes along; there is a special kind of pan put into the closet; this should be removed daily, and another pan, a clean pan, put in its place. At the present time, so far as I can make out, any kind of pan is used, and it is simply emptied, so that an unclean pan is put back. I could easily imagine that, when the temperature and humidity are pretty high, the smell from those must be very objectionable. I have noticed it myself. At the establishment where I lodged when I arrived here, I found that all the passages were simply reeking with odours. I left; I could not stay there.

5659. In your opinion, suppose that pans that have been just emptied are occasionally shifted from one house to another, would great risk occur of transfer of disease from one house to the other?—I should say so, if there is infection about.

5660. With typhoid fever in a house, would great risk be run in that way?—I believe so.

5661. You spoke, a little while ago, of the necessity of having clean pans. What do you mean by pans being cleaned; do you mean simply washed?—Simply they are taken away to the dépôt and washed, and some disinfectant is used in the water; they are dried, and then brought back.

5662. Have you visited any of the places around Melbourne where night-soil is deposited?—No, I have not seen that. I was not aware there was any night-soil deposited. I should be sorry to think so. I am afraid I should form a very bad opinion of such a system. I understood it was all taken away to a farm a long way out, and used for gardening purposes.

5663. So it is, eventually. You have not visited any of those farms or trenching places?—No.

5664. You did not go to St. Kilda, did you?—I went there; but that was before I got information with regard to hygienic appliances, and it was on a Sunday, and I was only there a couple of hours.

5665. The pan system in Melbourne is not what is carried out at St. Kilda. They have a double pan system there with closed lids?—That is a more satisfactory system.

5666. It is about as bad in Melbourne as it could possibly be done?—Yes.

5667. Have you made yourself acquainted, personally, with the management of sewage farms in other places?—I have not seen very many. We have a small one at Aberdeen. I also saw the one at Southampton, and I saw the one in Paris; but, further than that, I have not any personal acquaintance with them.

5668. Does your experience lead you to think that a nuisance necessarily attaches itself to the management of sewage farms?—None whatever, if they are properly managed. The great danger is for a superintendent to go and over-soak his soil, not to give it sufficient rest. Then, of course, it becomes a nuisance.

5669. In your opinion, would more nuisance arise from the creation of a well managed sewage farm some miles out of Melbourne than would now arise from our system of either trenching or ploughing in night-soil in various places some miles from the city?—No; the sewage farm near Paris is not far from the city, and there are houses within half-a-mile of it, and I am sure you may walk over the whole of that farm and not know it is a special kind of farm at all; you would think it was simply irrigated by ordinary water.

5670. Are you aware whether their system is broad irrigation or downward filtration?—They have both there.

5671. Are they both used systematically, or is the down filtration just used in emergency?—I am not quite certain.

W. J. R. Simpson
continued,
25th Sept. 1888.

5672. You said the pan system here was a very crude form. I did not quite understand whether, supposing it to be improved, you would still consider it unsatisfactory. I mean, do you consider the pan system, however carried out, an unsatisfactory method of disposing of night-soil?—For a large population, with plenty of water, I think it is unsatisfactory. There are some towns so situated that they cannot help themselves, and they must have the pan system; then it is the best that can be had; but, for a city like Melbourne, I form the opinion that the water system is the best.

5673. You consider it would be right to carry out the water system in spite of the possible large expense and engineering difficulties?—I think the pan system is an expensive system, and it must ultimately become, if you carry it out properly, a very expensive system, and not so satisfactory as the water-closet system.

5674. If the pan system is retained, what is the best way of dealing with the sewage matter from the pans?—At the present time, I believe, you trench it.

5675. I believe it is partly trenched in, and partly put on the surface and ploughed in?—I am advocating in India (perhaps the conditions are somewhat different there) the converting of it into poudrette, in order to first get rid of any contagious element that may be in the excreta, and then selling it to farmers.

5676. Do you use Farmer's desiccators, or some similar form of desiccator?—I am just in the state of advocating something. I think I should use Fryer's desiccators. I have seen them at work, and they seem very satisfactory.

5677. Where?—At Warrington.

5678. Are they used for ordinary faecal sewage as well as for house sewage?—Yes.

5679. Have you seen Farmer's at work?—No, I have seen his advertisements and the diagrams, but I do not know Farmer's at all; in fact, I think it has just come under notice recently, it is not a very old invention.

5680. Did you say that you had an idea of drying the faeces into poudrette in Calcutta?—I wish to do so. My reason is this, that there are trenching grounds, but we have what we call the rainy season, and those trenching grounds then become a great nuisance. Of course, if you have a dry light soil, and not much rain, the nuisance is not very great.

5681. But what would you do with the fluid sewage, the urine?—You evaporate that. You can evaporate it either in boilers, desiccators, or in Farmer's desiccators, 92 per cent.

5682. That is only the urine that comes in the pans; but what do you do with the rest of the urine, the house slops?—That is why I say, if you have the pan system here, in order to get rid of your insanitary conditions, you must have the drainage system.

5683. How do you intend to do in Calcutta—do you intend to have a drainage system there?—We have a very large area in Calcutta with no drains at all. There is Calcutta proper, which is drained, and the excreta is collected in the pan system, and there and then thrown into certain depôts. We have some eighteen depôts in the town. Excreta is taken in those pans and thrown into the depôts, which are connected with the sewers, and so it gets into the sewerage system; but for the suburbs, which we are taking in at the present time, all the excreta up to the present time has been trenched. What I want to introduce, until we get proper water-system drainage, is the poudrette, using it instead of burying it.

5684. Even in Calcutta, you regard the poudrette as simply a transition stage?—Yes.

5685. The water method being final?—Yes.

5686. But what becomes of your house slops; at present, you have no drains?—I would not like you to take the suburbs of Calcutta as a model for any place.

5687. But what do you do?—It just soaks into the soil, somewhat like your own.

5688. How do the sweepers do there?—Those are the people who are the scavengers. They have those little pans, and rather a dirty system they use there. They do not change the pans, but they have little porcelain gumlahs, which are used for the purpose. Then they have a large bucket with a cover, and they take those gumlahs and empty their contents into the bucket, wash the gumlah, and then put it back again, and, after they have got their bucket full, they cover it over, put it on their head, and carry it away to the depôt. This is all done between five and nine in the morning.

5689. The difference is, that you have labour so cheap, so that they keep on every day?—Yes. We have an immense number. For this population of 450,000, we have over 1,300 of those working sweepers. We only pay them seven rupees a month.

5690. That is about nine shillings a month?—Yes.

5691. Of course, the conditions are all so completely different. You do it there by the hand system?—Yes.

5692. The next question is, that allowing that the district boards of health are formed, in whose hands do you think the appointment of the officers of health for the city should rest?—With district boards, in India.

5693. I am not sure whether you understand the question. When the principal boards in India are formed, should the appointment of the officers of health remain in the hands of the corporations or be transferred to the district boards?—I think that, for the large towns, the appointments of the officer of health should lie in the local board, but that he should not be at the mercy of the local board.

5694. How would you protect him?—I would protect him so that he could not be discharged without the consent of the central board.

5695. With regard to the smaller districts, how would you provide for the efficient discharge of the duties of the health officers. The conditions, I believe, in Victoria are so different from what

one has in England. There they tried to combine a number of the local authorities, and give one health officer for seven or eight districts.

5696. Of course, I recognize that the conditions are different; but the problem we have is, that we have a number of small municipalities here, each of which may appoint its own health officer, and may not allow more than £10 per year as salary?—That is a very bad system.

5697. Can any good come with such a system?—No. I advised, in Scotland, while I was there, that Scotland should be divided into certain urban and certain local districts, and that the health officers should be appointed by the Government for each, and should be fully under the control of the Government. I think that is a very bad system you have at the present time. The best thing would be to join a number of small districts together and appoint a health officer.

5698. Now, the strong tendency is to split up on every possible occasion instead of joining, the tendency is the other way from what you advocate?—Could you not divide it into sanitary districts?

5699. Failing some opportunity to unite the local boards together in action of this kind, do you think it is advisable that the colony should be divided by the Government into sanitary districts, each with its own inspector?—Yes, by Act of Parliament. That is what I advocated some time ago for the Local Government Bill coming into force. In fact, you will notice that the Local Government Board of England, in this Bill that has just come before the House of Lords, does that. It divides the country into certain districts, into councils supervised by that council, and each of those councils will have a sanitary officer as its adviser, and they will have control over the local boards of England.

5700. You see England is divided into counties in a very marked way, and those boundaries are kept up. We have nothing of that sort?—It would be all the easier to make the sanitary districts then, because there is always the difficulty of opposition. People say we must have our county districts. We must have it divided according to the counties. Then you get one small county next to a large county, and perhaps one watershed in a different county, and so on, whereas in Victoria you have no counties, and it would be easier to provide it.

5701. If we were proceeding to divide Victoria into sanitary districts, each under the supervision of a sanitary officer, should the larger towns and cities in a district be excluded from his operations or included in the sphere of his work?—It would depend so much on the size of the town. For Greater Melbourne, of course, the health officer could have nothing to do with anything in regard to the extra-metropolitan districts. For such a town as Ballarat, where I have been, he could very well have a wide area round it—I believe there is Creswick not far, and one man could look after the whole of that circle.

5702. You would make the whole colony into districts round the chief towns, or make a special circle?—Yes; that is what is done in India for vaccination, what we call a vaccination circle—the whole province is divided into large circles, and there is a deputy vaccinator in each of them who looks after the particular circle; he is under the superintendence of the vaccinator, who is the sanitary officer—that is the old system.

5703. You were speaking as to the freedom of action of health officers and sanitary inspectors, you have no doubt the health officers might be appointed by municipal authorities?—Yes, so that they might select their man; but I think that the man should be qualified in sanitary matters; he should hold a public health diploma.

5704. Is it advisable that the health officer should be paid by and under the control of the local authorities—under their direction, that he should be completely their officer?—It has not acted well in England; in the very large towns it has acted fairly well, but in other places the health officer has always come to grief; and it would be better if he was fully under the Government as regards the control and under a central authority.

5705. Would it be possible to make distinctions between certain places, say—this is a large city and can appoint its health officer; this is a small one, and cannot appoint its own health officer?—In a large town like Melbourne, that is if all the municipalities were included in Melbourne, I think they could be very well allowed to appoint their own officer, and treat him fairly.

5706. Would not that reasoning apply to any large sanitary district constituted?—I do not think so, because you get such a mixture of interests; in Melbourne there is one predominant interest.

5707. In Melbourne and suburbs you think it could be done?—Yes, but not in smaller districts, because there are so many different interests bearing on the local inspector. If he does his duty, it means he is very uncomfortable.

5708. Would you include the inspectors of nuisances under the same kind of appointment?—I think so.

5709. What is your idea about a health officer being in practice?—I think, for a large town, that he should not be in practice; but I do think he should be allowed consulting practice or hospital appointment with consulting practice, because he is apt, if he has not that, to get into grooves and fall back; but I do not think he should be allowed private practice—only consulting practice.

5710. You think it is necessary that the independence of the health officer and the inspector of nuisances should be maintained?—I do. There is no fear of it in large towns, but in the smaller towns he is not independent, and cannot possibly be.

5711. And, consequently, cannot do his duty?—No.

5712. You spoke as to the necessity of health officers being qualified; would it be a gain to this colony if a public health course were instituted in the University?—I do think so. Public health matters are becoming more prominent daily. A medical man should certainly have an

W. J. R. Simpson
continued,
25th Sept. 1888.

opportunity of studying them. In the ordinary course of medical study, it is so seldom that one gets anything on public health. I know for myself, when I was a full-fledged M.D., I thought I knew everything, but I know perfectly well I knew nothing about public health. It was only after I studied the subject that I got some knowledge on it. I think there should be a regular course.

5713. With a special degree?—With a special degree. Or, as they have at home, a diplomat of sanitary science or B. Sc. in sanitary science. They have it in Edinburgh, and also in Aberdeen and Glasgow.

5714. Would it not simplify matters if this colony was divided into large counties, such as they propose in the electorates at the present time, according to the population. Would it not be advisable that it should be divided in the same kind of way into large areas of population, and that the health officers, regularly educated for the purpose of instruction in sanitary matters, should be appointed to an area containing a certain number of people, and paid out of the public money, and be not under the control of any local board whatever?—It would be a preferable way, according to the population. I believe you have some places where there is an immense area with very small population. I cannot put into my mind the size of Victoria.

5715. At present, the colony is being divided into single electorates. This might be made the basis of the health system?—It would be very convenient.

5716. Is it your opinion that the division of the colony based on electoral representation, and with respect to getting an equal number of voters, could be used as a basis of division for sanitary matters?—Not on the electoral basis.

5717. You would have to pay regard to the number of persons in the square mile, and other matters?—Yes, not on purely an electoral basis.

5718. Could you split up the colony and the metropolitan area on the same principle for health districts?—I think it is too much split up already. I would put it under one central health department.

5719. With a superior officer over that department?—Yes.

5720. And necessary assistants below him?—Yes. Just now, I thought you meant merely dividing the country into certain areas; but the electoral system, I am afraid, would rather go against sanitary matters.

5721. I merely allude to the division of the colony according to population?—I think the colony should be divided into sanitary districts.

5722. Would it not be cheaper in the end to let the health officers be paid by the Government or the central authority, and give them such an area as would occupy the whole of their time, and to let them have nothing to do with private practice, and would it not be more efficient?—It would be more efficient; I cannot say about cheapness.

5723. Do you think it is possible to get a sanitary system that is effective and cheap?—I am afraid not.

5724. By cheapness, I mean relatively to value?—Just so; of course, I am not in a position to compare monetary values here.

5725. Is there any other matter you would like to speak of?—There is one point. I do not know whether the Melbourne authorities have a disinfecting plant; if not, I think they ought to have.

5726. There is a sanitary station at Point Nepean, and a sanatorium at Williamstown?—Which the Melbourne authorities use?

5727. The buildings at Williamstown belong to the metropolitan municipalities; the things are sent from Melbourne and disinfected?—I was not aware of that.

5728. In your opinion, is it safe for a large part of the population of Melbourne to use for drinking water rain water collected from the roofs and not filtered?—I do not think it is healthy. I hardly know what you mean by safe.

5729. I wish to use the general term. Is it advisable that such water should be used?—I do not think so. First of all, there is the difficulty of storing. You get your storage tanks very often polluted. Very often the overflow pipes of those storage tanks are connected with some foul drain, so that often you get your water polluted inside the tank, and very often you get it polluted before it gets into the tank, from what is on the roofs of the houses.

5730. Birds' dung and those kinds of things?—Yes.

5731. Is it possible that roof water might be just as dangerous as a bad water supply of the ordinary kind?—No, I think not.

5732. In any thorough investigation of water supply matters, would it be right and necessary to institute an analysis of samples from rain tanks in various parts of the city as well as the Yan Yean water?—I think so, for comparative purposes.

5733. You think the practice of storing water in underground tanks should not be permitted?—I think not. Of course, there are many places where they depend on the rain water solely, and not much harm is done; but in a large town it is preferable, where you can get water, not to depend on the rain.

5734. Is there any further matter you would like to speak about?—I thought, perhaps, you would have liked to ask about the sub-soil waters, and as regards what has been done in other towns, the effect of drainage in other towns, but, perhaps, you have that in books?

5735. Yes, we have; but have you any personal information of your own that you can state shortly?—I think I gave that about Aberdeen, the reduction of the phthisis rate. In Aberdeen, when the drainage system was introduced, there was a considerable reduction in the death-rate from phthisis and from typhoid fever.

5736. Was it clearly shown that such reduction in the death rate coincided proportionately with the falling of the level of sub-soil water?—It was shown side by side with the progress of the drainage system that the death-rate decreased. W. J. R. Simpson
continued,
25th Sept. 1883.

5737. Did the establishment of the drainage system produce this good effect simply by carrying off the ordinary sewage of various kinds, or by draining the sub-soil?—Doing both.

5738. Was any special provision made for the drainage of the sub-soil, or did the sub-soil water find its way simply along the pipe?—The latter, there was no special provision.

5739. Should such special provision be introduced with any new system, or should the pipes be trusted?—I think the pipes are sufficient to carry it off. It always finds its way into the pipes, and by the sides.

5740. Is there any other point?—There is one point which might be of interest. Calcutta proper *pari passu* with the underground drainage has had its death-rate from fevers decreasing. The subsoil water has in the operations been considerably lowered; the suburbs which have not been drained have more than double the death-rate from fevers that the town proper has. I should like to add that in examining me on the conditions which contribute to make Melbourne unhealthy, and which, if not remedied, are likely to render it still more unhealthy, no opportunity has been offered me of expressing my feelings of pleasure in visiting so beautiful and magnificent a city, and I trust I shall not be misunderstood as under-estimating the very many excellent things that belong to Melbourne.

5741. *The Chairman* stated that Dr. Simpson had prolonged his stay in Melbourne chiefly to attend this meeting of the Commission, and he desired to express the general feeling of the Commission that they were very deeply indebted to him for his attendance, and for his valuable evidence.

The witness withdrew.

William James Keeble sworn and examined.

5742. *By the Commission.*—What is your address?—Clifton Hill.

5743. What is your occupation?—Builder.

5744. How long have you been a resident in that district?—A little over seven years.

W. J. Keeble,
25th Sept. 1883.

5745. Have you paid much attention in those years to the sanitary condition of that district?—Yes, considerable.

5746. Will you state the principal matters which have attracted your attention?—Some seven years back, circumstances brought me over to the district of Clifton Hill; unknown to myself, there was in that locality an abattoir and a boiling-down establishment. I do not propose to speak particularly of those, except as they refer to me as a ratepayer. I complained at the time to the local board of health in regard to the nuisances arising from those places, and, I must say with very great regret, with no satisfactory result. Finding that there was no satisfaction in appealing to the local board, I appealed to the Minister of the Crown; and through him those abattoirs were removed. Then, thinking that the removal of the abattoirs would be the means of removing the source of nuisance arising from the boiling-down place, I was much satisfied with the result; but circumstances proved that I was not to be so pleased as I expected, for from that time up to the present there is scarcely any diminution in the smells arising therefrom. What I wish to refer to particularly is the dilatoriness of the local board of health in their non-action in regard to the complaints of the ratepayers, and particularly the Board of Health Act, which I think should be amended or altered, and the experiences I have gained as to the working of the Health Act during the time I have been agitating along with other ratepayers.

5747. In what way was the local board of health dilatory?—By not recognising the continual complaints. The records of the local authorities and the central authorities for two or three years will prove it.

5748. I gather that appeal was made to the central authorities?—Yes, on more than one occasion; and once only did the central authorities take notice so far as to assist the ratepayers to carry out the objects they sought; that was some two years or eighteen months back.

5749. What action was taken?—Under the 93rd section of the Health Act, in the local court.

5750. With what result?—The result, that the defendant was fined; but there was no cessation in the nuisance worth noticing.

5751. Has any attempt been made to renew prosecution?—Yes, once successfully and once unsuccessfully.

5752. Was the non-success due to the prosecution failing?—It was due more to the defence and the defendant's lawyer; not so much from the want of evidence, but the want of the ratepayers having sufficient legal assistance to carry them through. The difficulty at present is that the proprietor, as far as can be gathered, is willing or anxious to move, provided he can be compensated; but the local authorities will neither compensate him nor take any action in regard to suppressing the nuisance; and as the matter stands, now, neither the local nor the central authorities concern themselves very seriously in the matter at all.

5753. How do you know that, as to the central authorities?—Because they have been continually written to in the matter, and have always referred us to the local authorities; and the local authorities almost always decline to take action.

5754. Have the local authorities cause, within your own knowledge, for refusing to take action, in that there is some difficulty in the law itself preventing them from getting a successful issue?—I think they have never seriously looked into the matter at all. For my own part, the

W. J. Keeble,
continued,
25th Sept. 1888.

opinion I have formed of the local authorities is very poor. I should like to point out my idea of the working of the Health Act, the direction in which I think it ought to be amended, and the authority that should have control of all health matters. I do not wish to make personal charges against any particular local authority; I only cited that as an instance.

5755. Your evidence, so far, is that there has been a nuisance in your vicinity?—Yes.

5756. And that you and other ratepayers have repeatedly tried to get the nuisance removed by the local board of health and the Central Board of Health—that action had been taken and prosecutions instituted, and sometimes they have been successful; and still the nuisance exists?—Yes, that is the substance.

5757. Have you any definite suggestions to make, shortly, as to the better regulation of health matters in respect to nuisances?—My suggestion is that the whole control of health matters should be taken away from the local authorities and placed under the control of a general body, with an inspector and health officers under their control, and entirely apart and separate from the local authorities in whose districts they may be appointed to act.

5758. Separate from the councils?—Yes; entirely separate.

5759. You would remove all health matters from the local authorities?—Yes; the present way things are carried on, it is impossible, even though councils may be willing, to carry out the Health Act in its integrity, they cannot do so under the present circumstances.

5760. You said just now you could not get rid of the nuisance—is that the way?—No.

5761. How would you?—I think that the 167th clause of the present Health Act, if it was put in working operation, would close the establishment, not remove it; and, of course, that would amount to the same thing, and would apply to all others that deserved the same treatment; that is to say the local authorities have the discretionary power of appeal to a higher court to close an establishment on sufficient evidence being presented. The Local Board have never taken advantage of that, neither has the Central Board.

5762. You think, if the local authorities took advantage of this clause, they can shut the place up?—Yes, that is my opinion.

5763. As a matter of fact, those powers are not used?—Not used.

5764. Is there any other suggestion you desire to make?—I think that is principally what I desire to say. I might state on this point that I could myself, at the time that the agitation against this particular establishment was going on, and could now, bring evidence for ten or twelve years back; and I think the evidence for ten or twelve years would satisfy any judge of the Supreme Court in closing any similar establishment.

5765. Your general contention is that the local boards have powers which they do not use?—Yes.

5766. And you advise that those health powers be taken away from the local boards and transferred to a central board, who should have officers under them responsible to them only?—That is it exactly.

The witness withdrew.

Adjourned to Tuesday next.

TUESDAY, 2ND OCTOBER, 1888.

Present:

Professor H. B. ALLEN, in the Chair;

A. P. Akehurst, Esq.,
W. McCrea, Esq. M.B.,
The Hon. James Campbell,

T. M. Girdlestone, Esq., F.R.C.S.,
Professor D. Orme Masson.

James Jamieson sworn and examined.

James Jamieson,
2nd Oct. 1888.

5767. *By the Commission.*—You are a Doctor of Medicine and Master of Surgery of the Glasgow University?—I am.

5768. And health officer of the city of Melbourne?—Yes.

5769. How long have you held that appointment?—About three years.

5770. Have you frequently visited the Metropolitan Abattoirs?—Yes, I visited them before I was appointed, and have visited them on several occasions since.

5771. In your opinion, can abattoirs erected on the present site be considered suitable for the purposes of Melbourne?—I think they can.

5772. Do you think that sufficient ventilation can be attained in the low-lying site in the valley of the Saltwater River?—Ventilation of the buildings?

5773. To have a sufficient current of wind passing between and through the buildings?—I think so.

5774. Currents of air between and through the buildings?—I think so.

5775. Do you think it would be better if the abattoirs were transferred to higher ground, more exposed to the prevailing winds?—I think they might be in a better situation.

5776. Do you think that any levelling operations of the ground between the Saltwater River and the Kensington Hill opposite the abattoirs would, without incurring prohibitive cost,

render the drainage of the abattoirs satisfactory, no marked alterations being made in the levels of the ground on which the buildings are now erected?—I am not sure that I know exactly what you mean. I could not, of course, say that raising the ground between the Kensington Hill and the abattoirs would afford proper drainage from the abattoirs to the river.

5777. I will put it another way—in your opinion, can sufficient drainage of the abattoirs' site, the actual site occupied by the buildings, be provided without complete alteration of the levels on which the abattoirs buildings are erected?—I think they could be drained into the river as they are now.

5778. And that effective drainage could be provided within the abattoirs compound itself with the same general levels?—I think there is sufficient fall to convey water; so far as I could see, there was a rapid flow of water in the drain at present provided.

5779. Is it your opinion that there is sufficient fall in the drains now existing within the buildings and between them?—Well, barely, within the buildings. In the main roadway there is a fall in two directions from the same roadway, and there can be hardly, under those circumstances, a very fair fall from there.

5780. Do you think that the past method of dealing with blood and refuse—burying it in trenches in the adjacent paddocks—has involved any serious danger to the health of the people dwelling around?—I do not think so.

5781. Do you think that, in future, blood-stained fluid should be allowed to flow from the abattoirs into the Saltwater River, or should all effluent water be clarified before being allowed to discharge into the river?—I should say it is desirable; but it could hardly be applied to one institution alone, if all kinds of foul water are still allowed to flow into that river and the adjacent river.

5782. Two wrongs do not make a right?—No; and again, as to blood stains, I would say it might depend greatly on the amount of staining.

5783. Taking the fluid as it now flows into the Saltwater River, do you think that fluid too deeply stained to be allowed to pass into the river without being clarified?—I do not think that it is desirable that so much blood should go in as goes in now.

5784. In your opinion, does the present state of the noxious trades on the banks of the Saltwater River constitute a decided nuisance?—Am I only to speak of those within the city of Melbourne?

5785. I spoke generally of all, in Melbourne and elsewhere?—Some of those are an unmistakeable nuisance.

5786. Do you think any of those within the city of Melbourne and suburbs constitute a decided nuisance?—There are some works attached to the abattoirs at present that, in my opinion, are a nuisance—that is the boiling-down establishments that are an appendage to the abattoirs, being built on the ground.

5787. Do you refer to the glue factories and gut factories as well as to the boiling-down places?—There is a gut factory in addition to the boiling-down places. I visited the gut factory a few days ago, and it is not at present well managed.

5788. Is it a fact that a large amount of fluid containing organic matter passes from it into the Saltwater River?—It is the case at present.

5789. Is it the case that the flooring is very dilapidated, so that the ground becomes soaked with fluid mixed with organic matter?—The flooring is not good.

5790. Is it a fact that the valley of the Saltwater River, especially in summer, is pervaded by a most obnoxious odour?—I would not like to say that, not residing in it.

5791. Have you frequently noticed an obnoxious odour pervading the valley?—I have felt it, but not to a great extent, and not to be felt at any distance off. I would like to say, specifically, that I have tried to discover a smell from the abattoirs and those places, at a distance less than that from the nearest dwelling-house, and could not find that there was any.

5792. From the abattoirs?—Yes.

5793. I refer generally to odours from the establishments in that district?—I have felt a very offensive smell at a considerable distance, but not since I took particular notice as to how far.

5794. Suppose this particular class of odours does prevail largely, especially in the summer, through that valley; would that fact mean that meat could not be properly hung in such an atmosphere?—I suppose offensive odours would be worse for meat than a perfectly pure atmosphere. I must admit that must be the case.

5795. In your opinion, then, should such offensive odours be allowed to prevail in a place where stock are killed for the bulk of the metropolis, and where meat is hung subsequent to killing?—It should be to as small an extent as possible.

5796. Would you recommend either that the abattoirs be shifted or the noxious trades be removed from that vicinity?—The noxious trades, as being the cause of offence, ought to be made to move; and I may say further, as to that point, that the Health Committee has rightly taken steps for the removal of those noxious trades that are located within its jurisdiction.

5797. All of those?—Yes, all those that are built on the abattoir ground.

5798. In your opinion, are those odours that come from the various noxious trades—fellmongeries, boiling-down establishments, bone mills, and so forth—distinctly and directly injurious to health?—I have no evidence on the point that they are.

5799. In your opinion, does indirect injury to health certainly occur, when the atmosphere is tainted with those smells?—It readily may.

James Jamieson,
continued,
2nd Oct. 1888.

5800. As a matter of fact, must it of necessity?—If the offence is great enough, direct or indirect injury must occur, if it is so great and continuous.

5801. If it caused the closing of windows, it would cause injury to health?—I should say that must be; I have no direct evidence that it is.

5802. You do not know from your own experience whether people are driven to keep their houses unduly shut up in summer time, in the close weather?—I do not know at all. On any occasions I have tried to discover how far the smell spread, I have not found it diffused to a distance equal to that at which any dwelling-house stands from the abattoirs. That is, standing back a distance equal to that or less than that of any dwelling-house, I could not find a smell.

5803. Even with the wind blowing that way?—I can speak only since I have been paying particular heed.

5804. Did you experience it when the wind was blowing it in a particular direction?—I visited the abattoirs last Friday, on a hot-wind day, and could not feel the smell of the abattoir works at a distance less than that to the nearest dwelling-house.

5805. Was that to leeward?—I went to leeward, so as to be in the course of the wind from that place.

5806. Generally, in your opinion, do you think it is expedient that the Metropolitan Abattoirs should be retained on their present site, with the alterations which have been suggested by the City Council, or should they be transferred to some higher ground with greater slope in the same area, or removed to some other district more suitable in regard to exposure and slope?—That is a difficult question; but, if I were to speak from a purely sanitary point of view, I would say I would wish to have every trade of the kind removed from the neighbourhood of the metropolis, if I spoke simply from my wish as the health officer, all those we have been speaking of.

5807. Looking at the matter from a practical standpoint, as you must also, what is then your recommendation?—Then comes the question of social and other pecuniary matters, that I do not think my opinion is any particular value upon. I think the abattoirs might be retained where they are, with improvements such as are being made, so that no injury need result to the health of the inhabitants, as the district is inhabited now.

5808. That being the case, do you think it is yet desirable that the abattoirs should be transferred to some more suitable site, where there would be greater facilities for drainage and greater freedom of ventilation?—Things being equal, if a better site could be got, I would say remove it to a better site.

5809. Do you think that the system of inspection of meat in the abattoirs as now practised is sufficient?—I think it is fairly satisfactory.

5810. Do you recommend any change in that system of inspection at the abattoirs?—I think the officers now do the work sufficiently well.

5811. Have you made yourself familiar with the condition of the suburban abattoirs?—I have visited some of them, but not recently. I visited some of them in connexion with an inquiry as to the prevalence of tuberculosis in 1884–5.

5812. What opinion were you led to form by your own investigations as to the propriety of retaining these suburban abattoirs in their present condition?—Those I saw were bad.

5813. You did not see all of them?—No.

5814. Do you think it is desirable to keep pigs within abattoirs?—It is not desirable.

5815. Are they going to be moved with the other noxious things?—They are to be moved. All those establishments, including the pig-feeding and boiling-down, are to be removed.

5816. Have you given the attention that you mentioned to the question of the smells arising from that neighbourhood. I understood you to say that the offensive smell from the abattoirs did not extend, in your opinion, to as great a distance as any house. Have you noticed at any time, from the racecourse, in the neighbourhood of the grandstand, a very offensive smell?—I have tried to discover the same much nearer than the racecourse, and did not succeed. I do not think I have ever been on the racecourse.

5817. On the high ground, where the stand is, there is sometimes a bad smell distinctly?—I think I have felt such a smell at the road there.

5818. From what establishment, in your judgment, did that proceed?—It came either from those boiling-down places on the abattoir site, the places that are to be removed, or from the other side of the river altogether.

5819. You could not distinguish?—No.

5820. Have you ever been there during the emptying of some of those boiling-down vats?—I have never seen the actual emptying take place. I have seen the stuff lying on the floor.

5821. That was after it had been taken out and had got cool?—Yes.

5822. Do you know whether it is part of the duty of the inspector to see the way in which the meat leaves the abattoirs, as to its protection from dust and dirt in the process of carriage?—I have seen the carts on the road, and they are not all very perfectly shielded.

5823. Does that come within the scope of the inspector's duty?—There is a by-law providing that they should be covered, but not that they should be actually enclosed, so as to be actually covered from sight. There is no by-law that they shall be enclosed in any close van or cart.

5824. There is no by-law to compel the persons removing meat from the abattoirs to protect it from the dust in the summer?—There is nothing to compel them, more than to have something in the nature of sheets hanging round about the waggon.

5825. I understood you there were only covers?—Sheets hanging down enclosing it; but not actually close. They may be blown about.

5826. Is it the duty of the inspectors, who are, in a measure, under your control, I believe, to see that those precautions are observed with regard to the carriage of meat?—I think they are always observed.

5827. That is not an answer to the question. I say, is it their duty to see that it is done; is it the duty of the inspector?—This is a new point raised, as to whether meat is protected *in transitu* to the city?

5828. Yes. You say you are satisfied, generally, with the system of inspection. I want to know is it a part of his duty to see, when the meat starts, if it is fairly protected from the sun and dust?—I understand it to be part of his duty; but I could not say whether it is specifically laid down. I think it is regularly done. The protection may not be perfect, but curtains are certainly hung down over it.

5829. You see, sometimes the wind that carries the dust carries away the curtains?—Possibly. I have not seen it.

5830. I do not say it is a bit worse there than at any other abattoirs. In fact, I think it is much better; but, generally speaking, the precautions are very lax?—I think it would be better if all persons conveying meats were compelled to do it in close vans, such as Bennet and some others provide.

5831. There is one other thing, whether, in your judgment, there is any necessity for some of the trades in the immediate vicinity of the abattoirs to be there; whether, in your judgment, it is necessary for them to be close to the abattoirs—some of the noxious trades that receive the products?—There is a clear advantage in having them there.

5832. But as to the necessity?—I do not think it is absolutely necessary. It is a question of money just.

5833. We were told by more than one that he could not carry on his trade at all if he were at a distance from the abattoirs?—He might not be able to make it pay. I think they might be removed. Those on the city grounds will have to go.

5834. Have you given any study to the question of the dead-meat supply from the country?—No, I have not.

5835. Have you any recommendations to make generally as to the subjects we have questioned you about; if so, we shall be glad to hear them?—With reference to the smaller slaughter-houses, I remember being struck with this fact, which apparently came out at the time of the inquiry made by the Tuberculosis Board, that as soon as strict precautions were taken at the City Abattoirs to stop diseased and ill-conditioned meat being killed there, they simply found their way to other abattoirs, where the precautions were less.

5836. And business at those places increased?—Yes.

5837. How should such tendency be checked?—Merely, I think, by reducing the number of abattoirs, so that every particular place could be better supervised.

5838. Have you any other recommendation to make in connexion with this subject?—I do not know particularly. I am unwilling to speak of any defects under the supervision of officers connected with other municipalities.

5839. If you make any recommendations in general terms that would not apply?—That is one of the main points that struck me as being very necessary, that, if the meat supply is to be properly supervised, there must be more centralization than there has been hitherto.

5840. In your opinion, would such sufficient centralization be obtained if there were one abattoir, the Metropolitan Abattoirs, for the northern districts, and one in a central position for the southern districts?—I think there might be two, for convenience. The question is, whether it would be desirable to have more than two.

5841. You are inclined to think that such an arrangement, one northern and one southern, would meet the requirements of the metropolis?—I think it ought; though, of course, the present City Abattoirs could be extended, I dare say, to supply the whole metropolis.

5842. Is there any other recommendation you would like to make?—I have no particular recommendations to make, except to refer to the fact (which is probably known to the Commission) that great improvements are in course of being made at the City Abattoirs, that a great deal of material that is now buried will be carbonized at an early day.

5843. Yes, we have a statement from the city surveyor and the town clerk as to changes it is proposed to make; and an important point, on which I desired you to supplement the evidence, was the matter I put to you as to whether the levels in the abattoir compound itself should be changed?—I think it would be better if the whole level could be raised a little, if possible.

5844. That would entail raising the whole level right up to the Kensington Hill?—Yes; and it has been mooted in the Health Committee of the City Council to have almost a complete set of new buildings at the abattoirs.

5845. Is there anything to prevent their being put on the top of the hill. They have chosen the lowest place?—That was, I suppose, with the idea of being near the river, to get an easy discharge—in the early days. But if they could be put higher it would be better. But there would be this disadvantage, that it would be brought nearer to inhabited dwellings.

5846. Suppose the abattoirs were properly supervised, is it a great disadvantage that they should be near human habitations?—I think I would prefer being half-a-mile away from them rather than five yards. But, things being always equal, the further away from human habitations the better. But greatly improved abattoirs nearer the human habitations might be better.

5847. You do not regard it as a *sine qua non* that they should be far from houses?—Not absolutely. As to the burial system that goes on at present, I think it will be an improvement when blood and organs are destroyed instead of being buried; but I do not see that any great

James Jamieson, *continued*,
2nd Oct. 1888. disadvantage could accrue from burying the great proportion of the contents of the paunches and stomachs of the animals. The effect of that would be to raise the level with vegetable matter. I do not see what harm could result from that.

5848. You refer to green food in process of digestion?—Yes; I think there is actual gain instead of loss to use that to gradually raise the level of the swampy ground adjacent to the abattoir ground. I examined it at my last visit, carefully—some of the places where that burying had been going on—and the level has been distinctly raised in some of those places a foot or twenty inches. I got a man to dig where the place had not been opened for eight months, and there was a crust of eight inches quite dry and hard before we came down on any trace of what had been buried at all.

5849. When you came down on what had been buried, what did you find?—Still remains of this vegetable matter.

5850. Did you see the blackening of the soil?—I saw some at the end of eight months. The greater part of what was traceable was vegetable matter.

5851. Was there any smell?—Very little there.

5852. Did you see anything beyond vegetable matter?—I saw black mixed with the vegetable—black parts.

5853. Bones?—No bones. I do not think any bones were put there; it was partly decomposed blood and sulphuretted hydrogen acting on the iron. The only smell that could be discovered in digging into that was if a portion was lifted and actually smelt. There was not immediately an odour when the crust was broken.

5854. What was the smell then, sulphuretted or ammoniacal?—Not ammoniacal, a sulphuretted smell; and even on the place where it had been buried about three months before there was a clear impermeable crust over anything that had been buried. There it was less of the nature of mould earth, and more of a sandy silt material, which, apparently, constituted the soil; so my experience was that places that had been wrought, even with the burying of that material, and had their level raised, were greatly improved, compared with those that are just undergoing the process now.

5855. If it is proposed to continue raising that level of the place near the river, would it not be better to raise at once the level of the ground where the buildings are placed?—The raising the level is very slow. Probably one burying over the surface might not raise it three or four inches.

5856. Is there any other matter on which you would like to speak. Another opportunity will be given you as to the drainage and sewerage of the city?—As to noxious trades, what do you include?

5857. Practically, we include all of them?—The more properly noxious trades I have had occasion to look to are the marine stores and the flock mills.

5858. Before you go from the abattoirs, will you tell me, with the modern improvements we have, whether abattoirs could be conducted in a populous community without any offence whatever?—I cannot see any difficulty in doing it, with proper appliances.

5859. You think that the killing of beasts, and all connected with it, could be conducted in a very populous community without offence?—I believe it could be done without offence.

5860. As to marine stores?—There are three or four of them in the city. They have not been very well conducted up to recently; that is, they are conducted in miserable buildings, and not always well drained; but, at my suggestion, notice has been given to all of them that they must make great improvements in the way of having good buildings—that are watertight, at any rate—with floors that are watertight, or they cannot be allowed to go on.

5861. Should such regulations be made generally throughout the metropolis?—I think so; because it would serve no purpose for the City Corporation to make such strict regulations, and just send them somewhere else; so they should be allowed to go on, but be regularly inspected. Only necessary improvements are ordered from unwillingness to drive them away where there would be less supervision; but notice has been given that they must improve the places to a very material extent if they are to be licensed.

5862. In your opinion, can any further steps be taken to secure additional improvement in their management?—It is difficult to make them altogether free from offence. They gather rags and bones, and those picked up in right-of-ways and back yards must get offensive if such establishments are to be allowed at all.

5863. You have noticed an offence from those bones and rags?—I have noticed an unpleasant smell from them; but I think that could be minimized greatly if the places had smooth watertight floors all over, asphalted or other, and they will be compelled to make those; and if no rain got in from above as now. I suppose the tradition in those places is that they carry on such a miserable trade that it is consonant with propriety that they should do it in miserable buildings.

5864. Will it be possible to break up the trade now done by marine stores, so that all decomposed or organic matter should be removed to some bone mill, or other place with desiccating machines?—I should be glad to see the places abolished altogether.

5865. Could such abolition be effected without causing a nuisance greater than now arises?—It would not be easily done in this municipality.

5866. You think the organization is not good enough to admit of the summary disposal of the various waste matters?—I do not think that can be done very soon. I should like to see it.

5867. Would it be wise to do away with those marine stores; do not they buy rubbish that would be concentrated on one spot?—They are useful in that way now, because the scavenging arrangements all over the metropolis are hardly sufficient. If those were sufficient, then it would be less necessary.

5868. There is no way by which you can compel people to take those things away?—Only by the inspector of nuisances seeing it and reporting on it.

5869. How can the inspector do that every day?—It cannot be done without great expense.

5870. Then those rag and bone men are doing some good in scavenging for their own purposes?—Collecting the bones and rubbish into one spot, instead of leaving it all over the city—dirty rags and bones.

5871. They take the dirt that pays, but do not take all; they leave a lot of dirt behind, therefore they select. Is it not so?—Yes.

5872. Select and bring to the yards certain stinking matters, and leave behind a greater stink than they brought?—They will not take anything that would not sell, but it is better that some should be taken than all left.

5873. Should not the city scavenger take all?—He does not clear the yards, unfortunately.

5874. Are not people compelled by law to put all the dirt of their yards into a pan for the scavenger to take away?—If the yard gets so full that the inspector considers it a nuisance, then the person is liable to be summoned into the police court, but not until it is so dirty that he can declare it a nuisance, and get leave from the health committee to summon the person into court.

5875. Do you insist on your inspector bringing those matters before the health committee before a prosecution is instituted?—Yes, I do not think it would be desirable to place the power in the hands of the inspector. A person of that grade should not be entrusted with that power.

5876. Does not the law say he shall institute proceedings against any person guilty of any infraction of the laws of the local board?—I know it is not done, and I question the propriety of encouraging it.

5877. Is it usual for the City Corporation to summons householders for dirty yards?—The ordinary procedure is, that the inspector finding anything offensive orders its removal, and if that is done without delay the matter ends.

5878. Suppose it is not done?—If a person is contumacious, he is summoned; but I do not presume that a person is often contumacious when he gets direct orders.

5879. Did you ever know of a citizen being summoned for having a dirty yard by the direct order of the City Council?—I would not like to say I know of a case. I know orders are habitually made for improvement.

5880. Did you ever, in the course of going round, see any dirty yards?—Frequently.

5881. There is in the Health Act, section 26, "Every inspector of any local board shall and is hereby empowered, without an express order or direction of such local board, to take proceedings against any person offending against any by-law made by such local board." I understand that that is not carried out?—I do not think any corporation would willingly give such power to an inspector of nuisances.

5882. He has the power?—But he might not think proper to exercise it. The point seems to me that the person gets specific orders to make improvement, and it is done.

5883. Or it is not done?—Something will be done.

5884. In section 134, which provides for the cleansing of private premises, it is stated that—"He shall, under the authority of this section, and without obtaining an order from such local board, give a notice, signed by himself, to the person to whom the same belongs, or to the occupier of the premises," and neglect to comply with that order makes a person liable to penalty?—The inspector does give the notices in his own name.

5885. But he does not institute prosecutions in accordance with the Act?—I do not think the inspector of any municipality would take that on himself. I do not think any municipality would allow a subordinate officer to draw it, possibly, into serious responsibilities.

5886. There is a clause in the Act which frees everybody from any responsibility of action taken *bonâ fide* in the discharge of duty?—*Bonâ fide* is just a doubtful thing; if an inspector involves his municipality in expenses it might be very well *bonâ fide*, but they could not very well allow it to go on.

5887. These sections of the Act are practically inoperative as far as prosecutions by the inspector are concerned?—Yes. So far as I know, the inspector of nuisances never, of his own option, institutes a prosecution in a case of that kind.

5888. How long would it take him to get the authority to commence this prosecution?—He inspects, and serves the notice generally ordering the removal. If that is done, the matter ends. On the occasion of his next visit, if necessary, after the notice is served, he would report to the health committee, and instructions would be given to prosecute.

5889. How long would that take after his reporting, in order to get instructions?—It would take a week; the committee meets once a week.

5890. Is not that a circumlocution?—Perhaps it is; but, as a rule, the question of removing from the yard is simply a question of sweeping it up and taking it away with a barrow.

5891. It is likely to remain so, if the householders know they can disobey the law?—I do not know that they do know that.

5892. As to the flock factories, what is your recommendation?—I think flock factories are almost doomed. There is a steady diminution in the amount of flock made in Victoria. There is a new downy material being introduced now from Queensland, I think; and no doubt the use of flock for bedding material is steadily diminishing, and I think will soon come practically to an end; but I would be glad if some general recommendation could be made for the proper cleansing and disinfection of those works.

5893. There should be some established method of doing it which should be followed?—Yes, and under orders from a central authority. It would be vain for any one municipality to give such

James Jamieson, orders. The effect would be that the trade subject to those orders would just shift to another municipality. I think all questions such as the disinfection of rags should be Government questions and not local.

5894. And all orders made about them should be centrally made and be universally binding?—Yes.

5895. Do you consider flock an injurious trade, as now carried on, in the neighbourhood of dwelling-houses?—It may be easily hurtful. Speaking for myself, I would not like to live close to one of those places.

5896. The rags are collected and have to be sorted out?—Yes.

5897. Each one picked?—Yes; cotton and linen rags laid on one side, and woollen on the other.

5898. Have you noticed the people doing this work?—Yes, I have seen some of it; but it is not a great trade. I have seen one man in a place, never more than one or two at a time.

5899. Is this picking over rags injurious to the neighbourhood?—Not so much as the tearing up.

5900. They are not clean rags?—No, some may be tailor's clippings, the rest are picked up out of all sorts of right-of-ways.

5901. They might be the clothes of people who died of fever?—Yes.

5902. They are picked up and sorted in the establishment?—Yes.

5903. Then they are torn to pieces?—Yes, the woollen ones.

5904. Are they subjected to any kind of cleansing whatever?—There is one place that has started a kind of boiler lately, I do not think there are more.

5905. They do not clean them the same as in paper making?—No, not the woollen. I suppose they send the linen rags straight to the paper-making places. The great trouble is with the woollen rags, which, if not used for flock or shoddy, would be valueless.

5906. Is there any other matter cognate to these questions concerning which you would like to make a recommendation?—Those are the only places that strike me as being, in the proper sense of the term, noxious. A butcher's trade may be noxious through neglect; but, strictly and necessarily, those others are noxious trades.

5907. Have you made examination into the mode in which hides are dealt with, in the interval between their being sent away for tanning or other treatment and their coming from the abattoirs?—I have visited some of those places where objection was taken to them, but not for making general supervision, it was for checking the nuisance in a particular place.

5908. Should raw hides be brought to town for sale at the large warehouses?—It would be better if they could be kept outside the city.

The witness withdrawn.

Robert Robertson sworn and examined.

R. Robertson,
2nd Oct. 1888]

5909. *By the Commission.*—You are the Inspector of Nuisances of Prahran?—Yes.

5910. How long have you held that post?—I suppose ten years. I have been with the council seventeen years.

5911. What other offices do you hold from the council?—Inspector of weights and measures, and I assist the surveyor in his duties in the sanitary arrangements of buildings and so forth—the numbering of the city, and the supervision of the night cleansing.

5912. Are you responsible for the administration of any other duties beyond those?—No.

5913. Have you any assistance in your duties?—Yes, I have a youth in my office to assist me in the clerical work.

5914. Do you adopt any system of inspection?—Yes.

5915. What is the nature of the system?—I go round in the different suburbs as often as I can during the week, and of course I have, in a large city like Prahran, a lot of complaints coming in to me daily which require attention; and they take a good deal of my time inspecting the places; and where I meet with bad drainage, which is principally the thing I have to deal with, I bring the matter before the board in its capacity as the local board of health, and get the necessary orders for the draining and sanitary arrangements of the premises.

5916. Have you any definite instructions from the local board of health in addition to by-laws?—No special directions. Where I recommend a drain to be put down in a property, I always recommend an open drain.

5917. Have you any direct instructions for your own guidance?—No; I generally report fully on the matter, and the board, as a rule, concurs with my suggestions.

5918. Have you found much difficulty in administering the portion of the Health Act relating to unwholesome food?—No, I cannot say I have.

5919. Have you had to institute many prosecutions?—Not lately. I had some time since, more particularly in regard to the milk business. We met with one or two very bad samples, and the parties were brought before the bench and heavily fined for adulteration; but the last three or four times the analysis has given a very favorable report.

5920. Have any by-laws been adopted to control the dairies in your city?—Yes; we compel all who sell milk to register once a year according to the Act.

5921. Are the premises inspected?—Yes, before the licence is given—twice a year, by a by-law.

5922. Is the condition of the dairy premises in your district satisfactory?—Generally so. There may be some improvements needed; and when they do occur we refuse the licence when the premises are not considered satisfactory.

5923. Have licences been refused?—Yes.

5924. You have inspected them twice a year?—Yes, according to by-law, and see they are properly whitewashed.

5925. Are they inspected oftener than that?—Oh yes, oftener than that.

5926. Once a month?—Not systematically; they are inspected in the course of the inspector's round from place to place.

5927. How often, in the course of a year, would you say?—I could not say that.

5928. Is it the rule in the dairies of your city to have special places for the storage of milk as distinguished from the places where the cattle are kept?—No, there is no special room; and that is a provision that I think we ought by some means to enforce. Most of the milk is obtained and got from the railway station, and it is then taken round to the different parts of the city by milkmen; there is very little kept on the premises; but I think on all premises where milk is kept proper dairies should be constructed.

5929. Would it not be simple to have a by-law to that effect?—Most of those places are not owned by the people who occupy them, and it would be difficult to get tenants to do anything for property belonging to other persons.

5930. How then do you think the defect should be remedied?—That is a difficult question to answer.

5931. Have you any suggestion to make?—I think it should be enforced; and, if not done by the parties who sell the milk, I think they should not be allowed to dispose of the milk.

5932. Have you instituted many prosecutions against butchers for having unwholesome food in their possession?—We have not lately had occasion to do that. We have done it. The time Mr. Cashmore was inspector for the Central Board, he and myself caused several prosecutions to be instituted, not only in Prahran but in other suburbs, because he took me with him round to enable me to see what was right and what was wrong as to the meat question.

5933. Were those prosecutions, as a rule, successful?—Very successful.

5934. Did you find any difficulty arising out of the words "knowingly sells"?—It was raised, but I do not know of any instance in which we failed to get a conviction.

5935. Were the penalties recovered such as to encourage you to prosecute in future?—Yes.

5936. Will you kindly state what action you take when your attention is drawn to a case of infectious disease?—Most times I communicate with the health officer, and visit the places, and, if necessary, cause the bedding and the whole contents of the bedrooms to be destroyed. The local councils pay the costs; we have had to do that in two or three cases the last twelve months.

5937. Have you ever been checked for ordering too great destruction, and involving the municipality in too great cost?—No; we generally arrange with the parties before the destruction, and get them to sign a paper stating that they are willing to have the things destroyed on the council paying the amount agreed on.

5938. Have you ever found any difficulty in making fully satisfactory inspection of premises?—None whatever.

5939. Do you think it is possible, under existing conditions, to obtain the necessary isolation of cases of infectious disease?—We have been successful, because any cases, say of typhoid, coming before us we have sent to the Alfred Hospital, and have paid the hospital authorities for the attention given to the patient.

5940. Have you found any great difficulty in enforcing the law relating to nuisances?—No, not as a rule. I find the Prahran people, as a rule, are tolerably law-abiding people. Sometimes, of course, it is very necessary to give notices, according to the 136th section of the Act, as to the removal of nuisances and dirty yards. The notices are given, and are invariably complied with; we very seldom have to prosecute.

5941. In such a case, do you prosecute on your own motion, or do you apply to your board to do it?—No; I take the action. The Act gives us power to prosecute direct.

5942. Have you found much trouble in your city as to the nuisances arising from the improper disposal of night-soil?—That is the difficulty of the day. Of course, the corporation enters into a contract (it has done so for years) to cleanse closet-pans at a certain rate.

5943. How are they cleansed?—Once a week, those undertaken by the contractor; but, it being a voluntary matter, some are done by private contract and others by public contract; and others dispose of it in their grounds, where they have large grounds and can put it away.

5944. You do not enforce the payment of any rate in this respect?—No; it is a matter that should be done.

5945. On everybody?—Yes, because the difficulty is this—you see we have a great number of streets in the city; a contractor's nightman has to go to No. 1, No. 15, No. 30, and so on; if that man is taken ill or becomes injured in any way or is incapacitated from doing his work, it is a difficult matter to put another man to pick up that man's work, hence those places become neglected, and I am inundated with complaints, whereas if it was done from house to house there would be no difficulty.

5946. If a householder in Prahran has been in the habit of having his pan emptied by contract, and fails to pay his fee for that operation, what happens?—The work is practically discontinued; but, on the other hand, I may say that we never discontinue this work till we give the householder notice. I send a notice as to what it will cost and so on.

5947. If the work is not done, it must lead to a very bad state of affairs; and what then is done by yourself?—They may go and engage other people.

5948. Suppose they did not?—That is a matter for us to find out. I may say, since this present contract has closed, I have had notices from persons to say, "Never mind, we will employ some other person."

R. Robertson,
continued,
2nd Oct. 1888.

5949. In those cases, where there may be some fair ground to suppose that people are neglecting it, do you take action?—Yes; but in most of the cases we can judge of the nature of the places.

5950. Have you a double system of pans such as prevails in St. Kilda?—No, that is a system I would be very pleased to recommend. I think the emptying of those pans night after night, impregnating the atmosphere with effluvia, is injurious, and should be abolished.

5951. What is your present contract price?—16s. per annum; the contractor's price is 15s., and the council charge 1s. for the working.

5952. For £1 you could have the double-pan system?—We might even get it done for less.

5953. After once the special pans are provided, it would not cost so much more?—No; I did recommend it to our council.

5954. Have you ever been present whilst the carts are emptying from a large building, where there are several pans?—No, I cannot say. I think the most we empty from one place is two pans. The coffee palaces have the largest number of pans.

5955. Have you ever been present when they are being emptied?—No. I know pretty well what the nuisance is. I have smelt it.

5956. Do you receive any notice from the nightmen of the mode in which they are going to dispose of the night-soil?—No, we do not.

5957. You do not require them to inform you of that?—No, there is no regulation of the council demanding such a request as that.

5958. Would it not be wise to have by-laws of that kind, and to require the nightman to produce a receipt, practically, for his night-soil?—Yes, any laws or regulations that would bring the nightmen under the supervision of the inspector or local board would be a good thing.

5959. There is nothing to check them?—No; we do not know where the loads go to. Only the other day, we had four or five loads tipped down in our roads.

5960. Is that a frequent occurrence?—It has been, the last few months.

5961. What is the difficulty to punish them?—To get at them; we have had two men out, besides the police in plain clothes, to see if we can catch them.

5962. You must catch them in the act?—Yes. I may tell the Commission that I made it my business to get the man who was cleaning up stuff on College-lawn lately to pick out some paper with some writing on; and I found some that came from South Melbourne and Richmond, according to the directions.

5963. Would it be practicable to have those carts locked up when they leave Prahran, and not opened till they come to the dépôt?—Yes, if we had duplicate keys. I do not see anything to prevent it.

5964. Would it stop the nuisance?—It should do; because a man could not discharge the contents of his cart till he got to the dépôt, unless he had a corresponding key.

5965. If a man had to discharge at the dépôt, could not you make him get a receipt?—Yes. Still, the man at the dépôt might be bought.

5966. How would you lock the cart up?—Make appliances for it.

5967. Would you be secure unless you had an inspector constantly following the cart?—Some one would be made responsible.

5968. Then you have no inspection of the places where the night-soil is disposed?—No; I may say that the contractor for our work, who lives at Bay-street, Brighton, is the only one who has land that he can put the night-soil on.

5969. What does he do with it?—Ploughs it in his ground. Trenches are ploughed out, and it is run in the trenches and harrowed in.

5970. Not simply covered over with soil?—No; ploughed out first. Then, as to the subject of keeping cows; I think, myself, so far as keeping them in small yards in the city is concerned, that they should not be allowed. I would not allow any, except they had an acre of ground.

5971. Have you seen many yards in which ducks and fowls are kept loose about the yards?—Yes; I often have to give notice about that. They are a nuisance wherever they are kept, especially in small yards.

5972. Does the drainage of your city discharge in one direction or many?—It discharges in two principal directions; first, into the Yarra, northwards, and then it passes along the St. Kilda road from Union-street, westward, and I think it goes into the lagoon.

5973. Where are the chief outlets towards the Yarra?—Near the tannery at the bottom of Yarra-street.

5974. On the other side of the bridge or the same side?—On the east side of the railway bridge.

5975. Where are the other outlets?—That is the only one to the Yarra; that takes the most of the drainage. There is a little drainage at Toorak which finds its way into the Yarra apart from that; but I think that is a very small matter; by the Grange-road and Williams-road, but the road is not formed yet. There would be a little drainage going into the swamp at Como, and there is an overflow from the Como Swamp into the Yarra.

5976. Is there any one channel leading away westwards, towards the lagoon?—We only go as far as St. Kilda-road. We have lately completed a large sewer in that direction in conjunction with the St. Kilda council.

5977. Where does that discharge?—Into the lagoon.

5978. Whereabouts?—Near the St. Kilda end, of course.

5979. What lagoon do you refer to?—The Albert Park Lagoon.

5980. Do you know how many sewers discharge into that?—No; I know a good deal of the St. Kilda drainage goes into it.

5981. Is there any from the direction of the Church of England Grammar School?—Yes, probably that goes that way; and there is a large watershed comes down there too.
5982. Do you have much trouble in your street drainage from want of proper fall?—No; we cannot complain, as a rule, of our drainage in the city.
5983. You do not have much water lying semi-stagnant?—No.
5984. Have you had much trouble with the splitting up of paddocks into building lots and building on small sites?—No; we get the roads formed when we find the nuisances arising from the inhabitants. We cannot anticipate the nuisances.
5985. Is it your opinion that the law should be amended so as to prevent building operations of that kind until provision is made for the drainage. Drainage of the land apart from building?—Yes.
5986. Yes; to have drains into which houses can discharge their foul water?—If the water is foul and offensive, and likely to be injurious to health, I presume the Act gives us power to do that now.
5987. What is the water that comes now?—Clothes-washing, and baths, and so on.
5988. Where does the bulk of the urine go?—That is put out with the general water—bed-room water they call it. It is diluted, but it comes into the channel.
5989. You have the bedroom water, bath water, clothes-washing water?—Yes.
5990. Do not they sink into the soil round those places for some considerable time?—We do not permit that, because we insist on a properly formed channel being made to carry it away.
5991. Are you able to insist on such provision being made?—Yes; that is my work principally.
5992. Do you find that houses are so put up that you have to drain the premises through other premises?—That seldom occurs in our city. Now and then we have to arrange for a drain to go through private property; but that is no practical difficulty with us.
5993. Is there any instance of a main drain carried under a house?—We do not permit that.
5994. Is not there a house in the Toorak-road built over a drain, in that low-lying part?—Yes, and the council had advice about that; they were told they had not authority to prevent it.
5995. Is not it the property of the council?—No, we do not hold the fee of the land through which the drainage runs.
5996. Do you know of any drain going under a dwelling-house in your district; you said you did not permit it, but do you know where there is such an instance?—Yes; in many instances properties cannot be drained in any other way, except under floors into streets. They have no back entrances, and there is no possibility of getting the drainage to the rear, they must get the drainage to the front; but, in any such cases of late, we insist on the iron pipes being laid down, instead of terra cotta.
5997. Those are what are now put down?—Yes.
5998. Did you have the older ones taken up?—Yes, in cases where we have had to interfere with the drainage. There are many of the sort in Chapel-street, where the drainage goes under the floors of the houses; but, in addition, there are many places specially, more particularly when the weather is wet. We find a good deal of water very often under the floors of those dwellings; and I invariably get an order from the local board of health to make examination, so as to satisfy us that there is water; and when we discover that, I report to the board, and recommend them to have this surface-soil drained with agricultural drain pipes and French drains, covered over with metal, and connected to our present sewers. The plan is prepared—I prepared it myself, approved by the council—by which those properties are drained. In all cases the council insist on a small pit being put down outside the buildings, upon the footpath, and properly trapped, to prevent any gas returning to the dwellings; and, of course, the flag at any time can be lifted up to see the state of those things.
5999. You said you would inspect and see whether there was any water under those dwellings?—Yes.
6000. Suppose you found damp soil or mud, would you report that?—I would; and not only that, but I would recommend what to do with it—that the surface-soil under the floor should be drained.
6001. You say you protect the houses from any reflux of sewer gas by traps; have you any system of ventilation of the sewers?—Yes, at certain distances there are air gratings put in over them.
6002. Opening straight on the surface?—Yes, no shafts.
6003. As to that house on the Toorak-road standing immediately over the drain, you say the council have no jurisdiction in the matter; is there no provision made for preventing such an occurrence as that of the erection of a house right over a sewer?—I think not, according to our solicitor's opinion.
6004. Is it your opinion that some such provision should be made?—I think so. Under no circumstances should any houses be built over sewers.
6005. Are there any cess-pits remaining in your city?—No, I do not think there is one in existence.
6006. You have the silt pits for the sewers?—That is in the sewers to catch the silt.
6007. Have all the cess-pits been abolished?—If there is any in existence it is unknown to me just now. I think I may say, but I would not be too positive, I do not think there is any underground cess-pit for the reception of night-soil in the city. I may mention that the board appointed three or four additional inspectors; and they made a house to house inspection; and they brought up full reports weekly as to the state of the cess-pits and the sanitary conditions generally; and

R. Robertson,
continued,
2nd Oct. 1888.

wherever a cess-pit existed the inspector reported, and orders were given for its being abolished; and none are in existence now.

6008. Did much contamination of the subsoil arise from those cesspits?—I think so, in some instances, especially where the tubs were used. In many places they put down, formerly, barrels, and did not properly plug them at the back with pulverised clay to keep the water from penetrating into the soil.

6009. Have you had an opportunity of examining the subsoil, through building operations, largely of late?—In many instances. Yesterday we were making an alteration to a building in Chapel-street, and I found the men ladling out water; and I gave orders to have the subsoil drained.

6010. What is your opinion as to the subsoil in your district?—In many places it is wet, more particularly where the gravel seams run across; the strata acts as a filter.

6011. Is it foul?—No, I do not think so, simply wet.

6012. You do not now see any great evidence of sewage contamination of the subsoil?—No; we are anxious to keep the premises as dry as possible. Last week I closed two houses because of the bad drainage under the floors.

6013. Have you had any complaints as to the tannery or fellmongery on the banks of the Yarra?—Not lately; not any complaint from there this last nine or twelve months.

6014. Do you frequently visit that?—Occasionally.

6015. We had a deputation last week that came and complained very strongly indeed?—They have never complained to the local board about that.

6016. They said they had?—Not lately; there have been no complaints lately.

6017. They said they had complained, and this nuisance was existing now at the present moment?—What I say is true, that there have been no complaints made to us as to that tannery for at least nine months. That, as a rule, is clean, generally speaking. Now and then I have gone down, and have found the skins and dirty washings about the place.

6018. Did you smell an offensive smell?—Yes, and there always will be in those places.

6019. What causes it?—It is the treatment of the hides, I suppose.

6020. Do you know that hides can be cured perfectly well without any smell whatever?—Yes. I have been down with the health officer, and he smelt it; and he considered that the smell was of no account, and could not affect any one.

6021. Was this complaint more than nine months ago?—I do not think any has been made for the last nine months.

6022. But before nine months?—There were one or two complaints made then, and the health officer and myself went down. We did take the case into court, I think, on one occasion; and they promised to abate the nuisance, and do the best they could to lessen the nuisance; and we have not had any complaints since.

6023. Is it advisable to have trades such as those, associated with strong offensive odours, associated with the place?—No; I think they should be further away, especially as the neighbourhood is thickly populated.

6024. You think they are an annoyance?—I think so.

6025. Do people have to close their windows?—I have heard so.

6026. Is there any other matter you would like to mention?—I think not.

The witness withdrew.

John Penhalluriack sworn and examined.

J. Penhalluriack,
2nd Oct. 1888.

6027. *By the Commission.*—What is your address?—Bay-street, Brighton.

6028. What is your occupation?—Butcher.

6029. Where do you buy your meat at present?—I buy most of it alive, at Newmarket.

6030. Where do you have it killed?—I kill the beef at St. Kilda.

6031. And the mutton?—The small things on the premises.

6032. Would your trade be seriously inconvenienced if you had to get your beef killed at the Metropolitan Abattoirs?—Certainly.

6033. Do you think any arrangements could be made, with the railway or otherwise, by which those difficulties would be removed, and thus have your beef killed at the Metropolitan Abattoirs?—I would not like to see it.

6034. You would be afraid of that?—Yes.

6035. No matter what arrangements were made?—I cannot see how it could be done; from what I know, that even now, in very hot weather, they start to kill late on Friday night, and the stuff is rushed into this place at the market, and by the time you get it home it is never set, it is alive all the time; and I have seen it stinking before eleven o'clock in the day; it never had time to set.

6036. At what time is your beef transferred from the St. Kilda Abattoirs to your premises?—Generally six o'clock in the morning.

6037. How long does it take to transfer it to your premises from the abattoirs?—Three-quarters of an hour.

6038. How long would it take from the Metropolitan Abattoirs?—It would take a pretty good hour to come out—an hour and a half with a load.

6039. I think you said three-quarters of an hour from St. Kilda?—Yes; and they do not push themselves there; I daresay I could do it a good deal quicker from there; it is about a mile

and a half. I thought you meant loading it and all; you could drive the cart there in half an hour.

6040. You could bring the loaded cart from the St. Kilda Abattoirs to your place in half-an-hour?—Yes; and then you see it is taken from the abattoirs to the market, and loaded first, and then unloaded and double-banked; so it never does get cold in summer unless it happens to come a cold day.

6041. Where do you keep your cattle after purchase and before slaughter?—In the yard part of the time, and part of the time in the paddock next the abattoirs.

6042. Do you think those paddocks are satisfactory?—They are not very good feed; there is not much eating. In fact, cattle will not eat very well even if it was there—they are strange.

6043. And the smell puts them off?—No, I do not think so. I have seen cattle put into a real good paddock, and they would not touch it till they were almost starved.

6044. From the standpoint of your own business, would it be better if there were one central larger abattoir to serve all the districts south of the Yarra?—For my part, I think you should have as many slaughter-houses as you can, so that you could know then which was the dirty one, and they would be easy to keep clean. Where there is such a big place they have never time to clean it, and it has never time to get cooled. With a little slaughter-house, it is done, and everything is away; half of the stuff goes away half-an-hour after it is killed; in fact, the slaughter-house is the sweetest place on the premises. In Ballarat—in Bridge-street—a very large business is there; and every bit of the killing is done there; and there is never a word, never a smell nor a sniff.

6045. Then the killing of cattle and sheep, in your opinion, could be conducted in connexion with the different butchers' establishments without nuisances?—Yes, but not everywhere. Where any one had room to do their killing, they could do it very well, and keep it clean. It would not make half as much smell as the sausage-house of a cookshop. I know when we clean our sausage-house you have to wash it down with hot water, and it is more disagreeable than the slaughter-house; that is my opinion of that.

6046. Then, in your opinion, I gather that it is not desirable to gather together all the killing of the southern municipalities?—No.

6047. No matter how good the establishment?—No. I think it would make it much dearer too.

6048. Would it make it more difficult to inspect, if it were all gathered in one establishment?—No, of course it would not; but I do not see any difficulty in inspecting; there is the policeman, that walks up and down the street. The sergeant at Ballarat used to do all the Ballarat inspecting; he was round nearly every day—three or four times a month.

6049. Have you seen many of the abattoirs round Melbourne?—Yes, I have seen them all.

6050. Are they kept as they ought to be?—Yes, they are kept as they should be.

6051. Are they properly inspected?—I should think they were; I have never seen them bad. I have always been in when they have been at work.

6052. Have you ever seen any abattoirs better?—I have never seen any others.

6053. Are you quite fit to judge?—I have been at butchering a long time.

6054. Have you seen many of them?—Yes, all of them; but they were working always when I saw them.

6055. Were they satisfactory places?—I think so; if you went into a place when a woman was washing it out, it would look different from when it has been tidied up; and it is the same with a slaughter-house.

6056. Is there any statement you would like to make?—No.

The witness withdrew.

TUESDAY, 9TH OCTOBER, 1888.

Present:

Professor H. B. ALLEN, in the Chair;

W. McCrea, Esq., M.B.,
T. M. Girdlestone, Esq., F.R.C.S.,
A. P. Akehurst, Esq.,

Robert Reid, Esq.,
Clement Hodgkinson, Esq., C.E.

John Fullerton sworn and examined.

6057. *By the Commission.*—You are the Inspector of Nuisances of the City of Melbourne?—
Yes. John Fullerton,
9th Oct. 1888.

6058. When were you appointed?—In May, 1867.

6059. What other offices do you hold under the corporation?—None.

6060. Have you any assistants in the discharge of your duties?—Yes, two.

6061. What duties do they perform?—They assist me in the inspection of the city as to sanitary matters.

6062. What system of inspection do you adopt in the discharge of your duties?—The system is this—the city is divided into six parts for cleansing night pans, and each morning there is a

John Fullerton,
continued,
9th Oct. 1888.

return made by the contractor, and all places where there are defective pans, or places that are neglected, either myself or my assistants visit early, and give notice to have them replaced. By that means we go over the city once, and perhaps twice, a week.

6063. Have you any system of inspection as to nuisances as distinguished from defective pans?—Yes.

6064. Do you regularly inspect all the parts of the city?—Yes, we are employed every day in the week, when not doing that duty, going from yard to yard, seeing whether the yards are cleaned, whether there is defective drainage, cow sheds requiring pitching, and so on.

6065. Have you any special instructions?—Only the by-laws and the Health Act.

6066. Will you state in one department after another the chief difficulties you find in the effective discharge of your work. First of all, what difficulty, if any, in regard to prosecutions for the having in store or the passing into consumption of unwholesome food?—There is one difficulty in that matter, in respect to purchasing articles for analysis. In some cases the owner has been summoned and fined; in other cases the servant has been summoned and fined. My view of the matter is this, that the law should define who is the responsible party—to my mind the owner, the master, should be made so. For instance, we have had some difficulty in adulterated milk; we got some, and subjected it to analysis; the summons is issued, the man has cleared out, the case falls to the ground. In one case, the owner was summoned; the man cleared out—he was away for months; the Corporation offered a reward of £5; he was arrested and brought to court. The owner was fined £20, and ten guineas costs. He appealed. Before the appeal came on, I served a subpoena to the young man who supplied the milk, and when the General Sessions came on he was gone again; and there would have been some difficulty in getting the case, only he failed in some grounds of the appeal, and the appeal went against him. They always send the drivers away, and the case falls to the ground; that is respecting the 33rd section of the Act. My view is that it should be defined—the owner.

6067. Do you find any real difficulty arise out of the presence of the word “knowingly” in the Act in those sections?—No.

6068. You find that if you can get hold of the person who sold the unwholesome stuff, you can institute a successful prosecution?—Yes, we can. In some cases the owner has been fined, in other cases the Bench has decided to take the vendor—the seller of the milk.

6069. What is the general state of the dairies within the city boundaries?—The dairies within the city boundaries are in pretty fair condition; that is more particularly under the supervision of Mr. Evans; however, we look after them also. There is one dairy that I had to complain of, and the case is coming off on Thursday.

6070. You say the general condition of the dairies is that they are fairly clean?—Yes. The dairies are registered, and Mr. Evans looks after that, and takes the supervision of them.

6071. Have you inspected them yourself repeatedly?—Yes.

6072. Are the yards in which the cattle are collected kept in a reasonably clean condition?—Yes.

6073. Are there any special dairy rooms for the storage of milk?—Only where they are large vendors of milk. Where they are small, there are not; in fact, there is very little milk kept. It is taken out and distributed.

6074. For the purposes of dairies within the city, should there be special stores for the keeping of milk?—I think there ought where there is milk kept. In some cases they have a room for it.

6075. Do you think that the presence of those store-rooms is likely to lead to evil, in the fact that the milk is kept in the house?—In some places the milk may be kept in the house, but it is only for a very short time.

6076. I mean, if there is a dairy room, would there not be a greater risk of selling stale milk than if all the milk is sent out compulsorily at once to the consumer?—I hardly know how to answer the question. It is this way—vendors of milk bring it in, and if it is not distributed they scald it. It is put in a copper inside another copper with water boiling down round it, and it is preserved.

6077. And you think there is no objection to the distribution of milk treated in that fashion?—No, I never heard of any injurious result.

6078. You think in all city dairies there should be dairy rooms?—Yes; where there are five, or ten, or twenty carts employed. Mostly the milk is brought from the farms, and then put in the carts and distributed.

6079. Does the administration of the portion of the Health Act as to Infectious Diseases come under your province?—Anything under the Health Act the health officer refers to me, as well as going himself.

6080. Do you find any difficulty in that direction?—No. People generally are willing to obey any instructions given.

6081. In a case of typhoid, what do you do?—Instruct them as to what disinfectants to use, and keep them from mixing with others, and see that the drains and privies are thoroughly disinfected.

6082. Do you think you can secure anything like effective disinfection of the privies?—Yes. Some months ago we issued circulars to every householder, giving instructions how that is to be done, and employed men specially for the purpose. Something like 16,000 circulars were distributed.

6083. Was the result satisfactory?—I find in some places, not all, disinfectants are used; and another thing I used with effect is the ashes from the wood fire put in the pans; it dries up and keeps down all smell. If all householders were to use that, little other disinfectant would be necessary.

6084. Would not the bulk interfere with the use of that?—It absorbs the moisture; the liquid matter is absorbed with the ashes.

6085. I mean the pan would not hold the ashes of the householder for a week?—There may be more than one pan. I know in my house, with six in the family, all the ashes are regularly put into the pan daily.

6086. Then your opinion is, I gather, that the system now prevailing in the city for the disinfection of the closets in houses where typhoid has occurred is fairly satisfactory?—Fairly satisfactory. I think I never met with a case where any one objected to obey the instructions given.

6087. Do they carry them out?—They have, so far as we could judge. We go back and find those disinfectants have been used.

6088. You have visited those houses sufficiently to form an opinion that generally those disinfectants are used?—Yes, that such orders are carried out. Even when the small-pox was here they were very willing to do what was required.

6089. Is your attention called to any large proportion of the cases of typhoid in the poorer tenements?—They are generally sent to the health officer, and if he does not go himself he acquaints me.

6090. Judging from the number you visit yourself, do you think that you have any large proportion reported of the total number of cases in poorer tenements?—I visited a good many, but I could not say I visited the larger portion. The health officer sometimes goes himself, and in a good many cases I have gone, or my assistants will go.

6091. I do not mean do you visit a large proportion of the cases that are reported to you, but do you get to know of any large proportion of the cases, so as to visit them?—I cannot answer for those. I can only answer for those that come to our knowledge.

6092. You have not looked into that question?—No, only what is reported to us; and when they are reported we take the necessary steps and visit them.

6093. Still you can form an idea; do you ever hear of any that are not reported to you?—I may hear afterwards that typhoid fever has been there.

6094. Do you hear of many of those?—Not many; just a case now and then.

6095. Is it within your knowledge that deaths very frequently occur from typhoid fever without your having any knowledge coming to you that they have typhoid fever?—A case may occur. I do not think they are very frequent.

6096. What difficulties do you find in administering the law as to nuisances—as to stables and yards?—None.

6097. You have no trouble in keeping them in good order?—No. As to yards being dirty—if a yard is out of order we give a verbal order, and we go back, and in the meantime they get it cleaned. The refuse is removed three times a week, and there is scarcely a case where they neglect it. They must be very careless people indeed.

6098. Then the provisions of the existing law are sufficient for that?—Yes; the Police Offences Statute enables us to deal with private yards more readily than the Health Act.

6099. I mean, there is sufficient law to enable you to keep yards clean?—Most decidedly.

6100. Turning to the system of dealing with nightsoil, of course the nightsoil of Melbourne is dealt with on the single pan system?—Yes.

6101. How often are the pans cleansed?—All once a week, some twice a week, and in a few instances three times a week.

6102. Under what circumstances are the cleansings twice a week or thrice?—By the proprietor of the place paying a fee for it. If it is done once a week there is no charge; if it is more than that there is a charge.

6103. Is the emptying twice a week or thrice done in a large number of private tenements?—Generally business places, or large families, where they want them emptied twice a week.

6104. Will you state what general regulations there are concerning the removal and disposal of nightsoil?—By the regulations the city is divided into six parts, and each part is emptied once a week, and, as I stated, those who require it more it is charged extra.

6105. Within what hours is the emptying allowed?—The general hour is after eleven o'clock. In the northern portion of Carlton, beyond Princes-street, they were permitted to commence after ten o'clock, as the contractors complained of the distance to carry the matter to get through the other municipalities in time to dispose of it, and the same is done in the case of a portion of West Melbourne. They are supposed to be out of the city before three in the morning.

6106. Should such regulations in regard to time be continued?—My own opinion is that eleven o'clock is early enough, but in those out-lying places they have a long way to cart, and when they go to Brighton they cannot get out in time to clear themselves, and they are summoned if they are over time.

6107. Would serious inconvenience result if the rules were altered to make the earliest hour to empty twelve instead of eleven?—I think it would be a very great inconvenience; they could never get out of the city in time.

6108. That, of course, is assuming they are carried in the same way, and to the same localities as now?—Yes. If they have to take it to the farmers as they do now, they have to go sometimes twelve miles out of town.

6109. When the night carts come to any premises, I understand the pans are just carried out and tilted into the cart?—The general rule is, the man in the cart carries a pan of his own, takes that into the yard and empties the householder's pan into his own, and puts the householder's one back, and brings his own back, and so saves the double journey. Where they get into rights-of-way that is altered, but where he has to carry it out he uses his own pan.

John Fullerton,
continued,
9th Oct. 1888.

6110. There is no process of cleansing the pans whatever?—No.
6111. In those rights-of-way, is there a liability that a pan would be taken from one house and emptied and put in another house?—It might, as an accident, but not as a rule.
6112. It is not a common occurrence?—No, only a solitary case.
6113. Do those solitary cases come frequently?—No, not frequently.
6114. Can you tell me where the bulk of the nightsoil is now being deposited?—I cannot tell from personal knowledge, but I am told it goes out Brighton and Caulfield way.
6115. Sometimes on the roads?—I do not think from the city contractor. With all respect, I think I am pretty sharp, and do not think he does. They have a system this way. Each carter has a ticket, and he must take that to the farm wherever he is taking that, and get a ticket back to say it is delivered there, for the farmer has to pay for that.
6116. Are the tickets registered?—The contractor keeps all those.
6117. You do not check them?—No, we have nothing to do with them. The contractor checks them, because each load is so much money to him.
6118. Is it the custom for the people taking the nightsoil to pay for it?—Most decidedly, as a rule.
6119. Then, in your opinion, there would be no difficulty in establishing, perhaps, on some more thorough basis, this system of registering receipts for the different loads of nightsoil?—That could be done. I have it from the contractor's manager that they must bring the ticket back the next morning, and if they do not they have to account for it.
6120. Would there be difficulty in making such regulations that nightsoil would be delivered at each receiving place in such quantities as would allow its being ploughed in daily, instead of every few days?—That would be a matter for the contractor; he has full control; it is his property, and he disposes of it to the best advantage he can.
6121. But could not some condition be inserted in the contract to make it necessary for him to deliver in certain quantities, say in quantities of 20 loads; not bringing it up in small loads, to lie about till it was ready to plough in?—I understand they must plough it in before a certain hour in the morning. The suburban municipality, I believe, have a regulation that it must be ploughed in before the hour of seven o'clock in the morning.
6122. Have you visited these nightsoil receiving places?—No, they are out of my boundary altogether.
6123. I understand, in a right-of-way where there are several houses, the contractor would take his own pan, and would empty each pan from each house into his own pan?—Not in a right-of-way.
6124. There are no disinfectants used by the nightmen?—No.
6125. Then his cart is open all the time?—His cart is open all the time while he is pouring the stuff in. He is bound to keep the trap shut while he is moving from place to place. I fine him a pound if he keeps it open in the street.
6126. While he is in a right-of-way it is open?—Yes.
6127. If he has a dozen closets to empty it would be open all the time?—Yes.
6128. The nightsoil is poured from the pans into his pan?—The pan the man uses is about the same size as the others.
6129. It has to hold the contents of several pans?—Certainly not; one at a time.
6130. He takes the pan from the back of the house, and where does he empty it?—Into his own pan.
6131. And where does he take that?—Into his own cart.
6132. Why not take the pan from the house to the cart?—It saves him a journey. Say he is 50 or 100 yards from the cart, it saves him the double journey, and saves a citizen's pan from being injured on the cart.
6133. Then he empties his own pan every time?—Yes. When he is in a right-of-way he may not use his own pan at all. If the cart is there, he will take each separate pan and empty it into the cart.
6134. Do you notice an offensive smell at the time?—Of course. I have not been out for some time, but no doubt it is while he is emptying it in.
6135. And if there are some dozen pans, how long would it take to empty them?—Not more than five or six minutes.
6136. The stuff is slopped out from one pan into another, and then into the cart?—No, not if he is in the right-of-way; it then goes direct into the cart.
6137. As to street drainage, are there many places in Melbourne now where the surface water has to be run into large catch-pits, and then carried off by pipes—for example, in the little lanes running back south from Little Collins-street, at the east end?—There are no catch-pits there now; there were some time ago at the back of Collins-street, but they have been abolished. They are level with the outlet drain long since, so that it goes clear away.
6138. How do those drains pass from those pits in those little rights-of-way?—There were only those two going under the houses into Collins-street. There are other places where they go from the rights-of-way into streets under houses.
6139. Are there many of that kind?—Two or three in Elizabeth-street; one near the corner of Collins-street, out of a right-of-way off the London Tavern; another between Lonsdale-street and Little Lonsdale-street, also running into Elizabeth-street. I might think of more.
6140. There is one at the back of Denis Brothers, is there not?—Yes, from Little Collins-street—it runs under Denis Brothers into Bourke-street. There is also a drain under the premises 33 Bourke-street, from a right-of-way leading off Little Bourke-street. There are a few places, and those

drains are being put in with iron pipes; the one in Elizabeth-street is between Lonsdale and Little Lonsdale streets—that has an iron pipe, and, I think, the one in Elizabeth-street I spoke of—but it is in the City Surveyor's department that those things are done; but all drains now under houses are iron pipes with leaded joints.

6141. What is the source of that bad smell that you always get at the corner of the Town Hall?—My opinion is there is an open hole into the sewer, and the sewer gas comes up the grating.

6142. In your opinion, has that smell been a new thing since the deep sewers were put down?—Yes, that is my opinion. I think it is the sewer gas with the current from the river, and it is an open space it comes up.

6143. Where, exactly, is the opening?—On the north-east corner of Collins and Swanston streets. It is near the corner opposite the City Surveyor's office.

6144. Have any steps been taken to remedy that smell?—I do not know. The place just now is covered with hoarding. That is about the worst grating I know in the city.

6145. Do you have much trouble as to the management of wet cellars?—No. Some years ago I got the greater portion of those cellars asphalted, and that is a great means of keeping them tight. When the present Health Act was about to be passed, I suggested that those cellars should be pumped dry and cleaned daily, and that was done, and that Act gives the power.

6146. Are a great part of the smells in some of the large streets from those cellars?—It may be; sometimes we have had great trouble with some of them. In some cases the drainage of the house goes into the cellar, and is pumped out with the cellar water.

6147. Have you prosecuted in those cases?—Yes; it is under the bye-laws.

6148. Does the Health Act work satisfactorily for that?—I do not know of its being in the Health Act.

6149. What is the condition of the cellars at the corner of Bourke and Swanston streets, between the Albion and Cleal's place. In Bourke-street, beyond the corner, and two or three doors up Swanston-street?—The one at the corner of Swanston and Bourke streets is drained into the sewer now, and has been for some time, and so also is the Royal Mail—that is drained into the sewer. Those two cellars were a great deal of trouble in times gone by, but they are drained into the sewer now.

6150. The Health Act provides for the asphaltting of cellars?—Yes, I take some credit to myself for having that done. There is no reason for making an offence with stinking water. It may be pumped regularly every day, and not be offensive under certain circumstances.

6151. Where are the chief discharges from the drains into the Yarra—where are the chief openings?—Opposite King-street is one, and the principal one.

6152. And there are others opposite Elizabeth and Swanston streets?—Yes, the one in Swanston-street is near the Prince's-bridge, and there is one opposite Market-street.

6153. Have you visited those outlets?—Sometimes. Those are under the control of the City Surveyor's department. They are not under my control.

6154. Where does the drainage go to the west of Latrobe-street, that used to go into the swamp across the railway to the west end of Latrobe-street?—I think it goes on the street now.

6155. Does it go into the swamp?—I think it is carried by a straight channel down by Dudley-street, and goes into the swamp ultimately.

6156. Have you noticed much nuisance arising at the outfall?—The drain goes from Spencer-street under the railway, and so the drainage from the railway to the swamp was very offensive at one time.

6157. What about now?—I have not been to the swamp lately.

6158. When you visited the outfall drain last?—It was very foul. I suggested that it should be a pitched channel across the swamp to carry the drainage into the river.

6159. Have you frequently been present when the catch-pits in the main sewers in the large streets have been cleansed out?—I have seen them being emptied out, principally the eastern portion of the city—East Melbourne. I have not seen the cleansing at night in Elizabeth-street; that is under the control of the Surveyor. The cleansing of the streets and those catch-pits are in his department.

6160. Have you had many opportunities of noticing the subsoil of the city in the excavation of the city?—Yes, frequently.

6161. Is the condition of the subsoil satisfactory?—Much better than it used to be.

6162. It was very foul in the old days?—Yes.

6163. And you have noticed a distinct improvement?—Yes.

6164. Since the earth closets were introduced?—Since the cesspits were done away with, and filled up, the subsoil is quite different.

6165. You do not regard it as entirely satisfactory even now?—Where old buildings have been it is hardly satisfactory; but I have been pleased to see that many places, when opened up, are better than I expected. In Collins-street, where they are excavating, near the Bank of New South Wales; some years ago I got that filled up—where there was a fruit shop—and there was water under the floor, and when it was excavated just now it was much cleaner than I expected.

6166. When nuisances arise, and sufficient remedy does not come on your own immediate recommendation, do you institute proceedings yourself or report to the Board?—In ordinary nuisances, such as dirty yards, and pumping the water, and so on, I take out summonses myself, without referring to them. Any case where an order has been served on any individual to make drains or rights-of-way, if they do not comply that is reported to the Local Board of Health, and they order the prosecutions—that is then out of my hands—but where it is dirty yards or offensive water, I take proceedings without reference to any one.

John Fullerton,
continued,
9th Oct. 1888.

Yes.

6167. As to dairies—the large dairies, you said, should have rooms to keep the milk in?—

6168. Are those rooms in the dwelling house?—They are adjoining.

6169. They are not inside?—There is Baker's, he has the largest, that is outside; and there is Savage's, that has a room adjoining the dwelling-house—not in the place.

6170. Baker's is closely built round?—I mean sleeping apartments; and the stables are near; but the place is kept very clean.

6171. Are those dairy rooms generally immediately adjacent to the cow-sheds?—Baker has no cows at all; he has stables and cows at the farm; and the same with Savage—they are only distributors of milk. It is only the smaller people that have cows.

6172. And in those smaller places there are no dairy rooms?—No; just a small place for keeping the dishes. In fact, there is very little milk kept; as soon as the cow is milked, the milk is taken out and distributed.

6173. Are there any cows fed on the West Melbourne Swamp?—I think there are a few still.

6174. Did you ever see any of those cows milked?—I have.

6175. Did you notice anything about them?—Only that the cows' udders were dirty.

6176. Where had the cows been?—In the swamp.

6177. Did you see anything done to them before they were milked?—They were generally washed.

6178. Do you think they are always washed?—That I could not answer.

6179. Did you ever see any unwashed ones milked?—I cannot, at this moment, bring to my recollection any case of that.

6180. Did you ever hear of any evil results as to health from the milk from those cows?—No; I have got the milk from those cows, and submitted it to Dr. Girdlestone, and he could speak of the result.

6181. Is there any matter you would like to make a statement upon?—No; the only question was that in the Health Act as to adulteration; that is the only thing I wished to speak specially about, and you have opened that up specially.

The witness withdrew.

Richard Speight sworn and examined.

Richard Speight,
9th Oct. 1888.

6182. *By the Commission.*—You are the chairman of the Board of Railway Commissioners for Victoria?—Yes.

6183. How long have you held that office?—Nearly five years.

6184. What has been your previous experience in railway management?—From a boy. I have been 40 years in the companies.

6185. What services were you connected with?—All the branches of the railway service.

6186. Did you become conversant with any large branch of the London meat trade, either live stock or dead meat?—Yes, so far as railway transit is concerned.

6187. Were you able, from your experience, to form any conclusion as to the relative advance of the live-stock trade, and the dead-meat trade towards London?—I think the practice as to meat in London is, they kill up in the country districts and in the neighbourhood of towns, and they send what we call the prime cuts to London—not the whole carcass—they merely send a portion, such as the surloins, and the ribs, and the portions that fetch the highest price in the London market. The quantity of dead meat carried to London compared with the live stock sent to be slaughtered there, I should think, would be between one-third and one-fourth.

6188. Did you find that the proportion of dead meat so carried tended to increase during the latter part of your experience at home?—It was always a growing quantity.

6189. Turning, then, to the conditions here, will you kindly state what are the rates of freight now charged for the carrying of live stock and dead meat in Victoria?—As to all live stock, we charge per truck per mile up to 100 miles 9d. per truck per mile, above 100 miles we charge 3d. per truck per mile till we get to 150, and after that we charge an all round rate of 7d. per mile per truck. That refers to both sheep and cattle.

6190. Are any rebates made in connexion with the carriage of live stock?—Not in connexion with the carriage of fat stock, but to facilitate the carriage of store stock to the feeding farms we do knock off one-third of the rate when the trucks are laden with store stock going down, and we are able to bring a load back of fat stock to the city; and upon off days—those are the days when the Melbourne markets are not running—in order that we may make the most of our trucks, and give an inducement to the dealer to use the off days, we give him a rebate of 20 per cent. from the rates I have just mentioned to you.

6191. What, then, are the rates of freight for the carriage of dead meat?—Our rates at the present time are 5d. per ton per mile, but we practically carry no dead meat. There is a disposition just now to start this country slaughtering business. Palmer Brothers are erecting a place just beyond Terang in the Western district, and they have established also a depôt near Wangaratta; they have not yet commenced real business, but it is their intention to kill in those localities, and supply the Melbourne market.

6192. Do you propose to modify the tariff?—If the trade becomes a trade, we shall have to pay some regard to the cost of conveyance, and assimilate it to the cost of conveying live stock. At present it is no trade at all.

6193. Under the present rate, the tariff would press rather hardly, would it not, on those who dealt in dead meat?—I do not think any business could be done at the rate of 5d. a mile—2s. 1d. a ton per mile—that is against the average of 7d. per mile for live stock, so if a trade sprang up we should have no hesitation in fixing a rate that would meet the necessities of the case.

6194. Would you wait till the trade sprang up?—It is no use putting a rate in your book if there is not the traffic to come for it.

6195. Directly any *bona fide* proposals were made, you would make an arrangement?—Certainly.

6196. Can you furnish us, at your leisure, with statistics as to the number of stock carried, during say any one year, by rail?—I can give it for the last financial year, June, 1888.

6197. Indicating the centres from which they come—the main lines?—My notion was to give you 20 or 30 of the principal forwarding points, and then you would be able from the total of those 20 or 30 to see where the rest comes from—that is, how much would be left from the little places that are comparatively of no great importance.

6198. Are those statistics prepared?—Yes; I could give them now, but I will have it made out in a form that will give you the information perhaps clearer than it is here. Just broadly, our revenue from the carriage of live stock, which includes sheep, for the last year was £134,000; some 25 stations sent the bulk of that traffic, and from Echuca, Deniliquin, Wodonga, and Wahgunyah, there was about one-third of the stock came from those places. I mention those places as being border towns of Victoria. I call Deniliquin a border town, because practically it is the same thing—the port for Riverina.

[The following return was subsequently supplied:—]

VICTORIAN RAILWAYS.

REVENUE FROM LIVE STOCK TRAFFIC FOR YEAR ENDING 30TH JUNE, 1888, £134,483.

Particulars are given below of forwardings from Principal Stations.

| Station. | Calves. | Cattle. | Pigs. | Sheep. | Revenue. | |
|-------------------|---------|---------|-------|---------|----------|-------|
| | | | | | £ | s. d. |
| Sandhurst | 29 | 1,260 | 954 | 25,893 | 1,272 | 4 6 |
| Rochester | 21 | 1,512 | 703 | 21,202 | 1,056 | 13 0 |
| Echuca | — | 3,990 | 2,069 | 65,191 | 4,130 | 15 6 |
| Deniliquin | 4 | 20,753 | 66 | 305,639 | 20,254 | 9 6 |
| Kerang | 20 | 3,123 | 824 | 63,521 | 3,921 | 18 6 |
| Geelong | 444 | 1,682 | 3,703 | 8,543 | 721 | 10 6 |
| Ballarat | 111 | 1,638 | 288 | 15,502 | 1,935 | 9 4 |
| Ondit | 209 | 882 | 656 | 33,351 | 1,521 | 0 7 |
| Camperdown | 154 | 1,817 | 131 | 47,410 | 2,959 | 2 1 |
| Dunkeld | ... | 296 | ... | 28,226 | 1,123 | 6 6 |
| Seymour | 389 | 628 | 371 | 2,360 | 242 | 16 8 |
| Benalla | 200 | 5,351 | 820 | 14,059 | 3,806 | 2 2 |
| Wangaratta | 57 | 2,897 | 1,182 | 13,719 | 1,990 | 5 7 |
| Wodonga | 327 | 29,975 | 3,343 | 50,759 | 19,544 | 17 7 |
| Yea | 247 | 1,434 | 1,956 | 11,972 | 923 | 18 9 |
| Tatura | 91 | 152 | 2,670 | 13,505 | 750 | 13 0 |
| St. James | 11 | 156 | 14 | 9,580 | 415 | 14 0 |
| Yarrawonga | 62 | 637 | 918 | 24,917 | 1,520 | 8 7 |
| Wahgunyah | 41 | 6,052 | ... | 94,597 | 6,985 | 15 0 |
| Dandenong | 386 | 822 | 1,553 | 3,150 | 344 | 2 0 |
| Sale | 287 | 4,800 | 3,687 | 21,532 | 3,122 | 10 8 |
| Heyfield | 88 | 1,809 | 785 | 1,942 | 926 | 8 4 |
| Maffra | 577 | 4,579 | 954 | 11,738 | 2,675 | 19 0 |

P. P. LABERTOUCHE, Secretary.

6199. Then you have as well the cattle trucked at Wodonga; what proportion came from Victoria, not across the border?—You may take it that all of that came across the border; very little is collected at Wodonga from the north-eastern district. The traffic from those places you may take as practically coming from the back country.

6200. Can you state what is the average time that a stock train takes to come from Wodonga to Melbourne?—They run about 20 miles an hour—eight to nine hours.

6201. Is that a general rule, as to stock trains?—Yes.

6202. That does not include stoppages and shunting?—Yes, it does. Most of this stock is conveyed by special train. It leaves the previous evening, and is in the market very early the next morning, ready to catch what they call the height of the market.

6203. Some time ago the stock agents of Melbourne gave evidence, and furnished statistics, as to the number of cattle and sheep that were killed in transit, but on cross-examination it appeared that the figures given by them dealt only with those that were found killed at the Melbourne depôts. Are many cattle and sheep, as a matter of fact, removed dead or dying at intermediate stopping places?—No.

6204. Are removals chiefly at Melbourne?—Yes. If a beast gets weak, and is down in transit, they get it away if they can, but it is the exception.

6205. Are any registers kept of the number of stock killed in transit?—I had occasion some time ago, when I saw the discussion in the newspapers about the humanitarian view of the question, to go into that, and records were got from the office, and I found that taking into account

Richard Speight,
continued,
9th Oct. 1888.

the amount of business done the casualties were very small. Of course, I am expected to defend the railways, and you must take that for what it is worth; but in many cases those casualties were not the result of the railway traffic, but the result of fatigue that the animals had undergone before they came into the railways. There is the cattle traffic from Queensland, and when they get to Albury they are in a delicate state, and we get them at the fag end of the journey, and if they go wrong, or are down, it is the result of what they have undergone before they reach us.

6206. Is any noteworthy portion of stock received at Echuca and Wodonga unfit for the rest of the journey?—There is a recent experience in the stock from Queensland. I have seen cattle in that state up there, and I found it was the result of the long journey they had undergone before. With that exception, I say "No."

6207. Could the cattle unfit to come down be weeded out without any great difficulty?—I think so. If this long-distance traffic is to continue, it may be necessary to have some one not connected with the railway department, one of the inspectors of stock, to keep a supervision over it—to say whether a beast is fit to go on the journey or not.

6208. Just mark the beasts not fit for the journey?—Yes.

6209. Have you ever visited the Newmarket siding at the time when the stock would be untrucked?—No.

6210. You cannot say, then, whether any large proportion of the cattle seem severely injured?—Not from personal knowledge. From inquiry, I am able to say it is not so; but if you would like to have some one from the department who has a personal knowledge of the condition in which the stock comes I will be very glad to send him. I do not tend to a personal knowledge as to the arrival of the cattle in the market at Melbourne, but I know from my own inquiry that the general condition is satisfactory.

6211. Would there be any prohibitive difficulty in the way of running cattle trains at a considerably high rate of speed?—You see, if you take eight or nine hours to come from Wodonga, it is practically 30 miles an hour when running, because there are the stoppages, and the horses taking water, and coal, and changing the horses. Those trains run certainly not less than 30 miles an hour, which is quite fast enough, considering the grades and the condition of the railways here.

6212. And fast enough for the cattle themselves?—Certainly.

6213. Could the amount of shunting be reduced?—It is the minimum now. As I say, the bulk of the stock that is brought into Melbourne is run by special stock trains, and every vehicle is supplied with one of those screw-couplings, and each vehicle is screwed up so close to the next vehicle that rebound is reduced to a minimum. Practically, there is no shunting. In the single trucks, with the stock that come down, you cannot tie them up in the same way; they have to take their place in an ordinary train, and there is occasionally a rebound which causes a movement that may not always be pleasant to the stock.

6214. As to the complaints in the papers, have they to do with the single compartments?—My observation of the complaints in the papers is, after they are investigated, that other causes than railway causes account for the condition of the stock. Our customers are never unwilling to complain if they have anything to complain about. If a consignee or consignor find his property in bad condition, he does not hesitate to come to us, and it is our duty to inquire who is at fault, and very often it is found that we are not; but taking into account the amount of business done, and comparing my experience at home with my experience here, I say we are comparatively free from any charges of neglect or want of arrangements.

6215. Have you made such inquiries as to satisfy yourself whether the regulations with regard to the tight coupling of the stock trains are habitually observed?—Yes they are, I know, and we had the congratulations of the stock and station agents at the result of the adoption of those screw-couplings.

6216. How long have they been in use?—About three years.

6217. With regard to the present stock traffic, as apart from any changes of a large character that may be made in future—would there be any great difficulty or cost in taking a siding into the cattle yards?—We got out an estimate some time ago. It would cost about £10,000 to put a siding in the Newmarket yards. At the present time the unloading yards are on the Flemington branch, and practically that is the siding for all cattle-market purposes. The cattle, if they were landed in the cattle market by a siding, would have to be walked to the different pens where they are required to be put in, and there is nothing but a road between the discharging sidings of the railway and the general cattle yards.

6218. But, if the cattle yards are retained on their present site, cattle could be delivered at once, without meeting pedestrians?—It could be done. The question as to convenience is another thing altogether. My own view is that the present arrangement is as good as any, apart from the risk any person may incur in walking down the thoroughfare; but I never heard of any one coming to grief over it, and any siding could not be worked so conveniently for the traffic as the present arrangement of this branch with the traffic is now dealt with, but it is feasible, and that has cost us £10,000.

6219. Then, turning again to the dead-meat trade, we have been given to understand that a truck that will hold ten head of cattle would suffice to carry about fourteen carcasses. Is that about correct?—I should think it would be about that.

6220. Then, if the rates for freight for live stock and dead meat were both at per truck, there would be considerable advantage in favour of the dead meat traffic?—We should have to fit in our rate for the dead meat to be fair, comparatively, with what we charge for the live stock. Of course we have to perform services with the dead traffic that have not to be performed with the

other, and charges in respect to that would have to be made; but, looked at from a purely commercial point of view, as to whether dead meat could compete with the live stock in the Melbourne market, the question of railway rate would not be allowed to stand in the way of it. You need not consider the railway difficulty in dealing with that point.

6221. Is there any necessity to perform those extra services?—Yes, the dead meat will not move; it has to be loaded and unloaded into the sheds, and taken away by the consignees, just the same as general merchandize.

6222. It would not be possible to have a siding at the killing-place, and let the killer load the trucks?—It depends. The Palmers are establishing places on such a large scale as to justify sidings being put in, but it is not everybody that can do that; and wherever the business is big enough for a siding and the site is suitable, we should do as we have done in the case of the Palmers, put sidings on terms satisfactory to them.

6223. Then they will put the meat in themselves?—Yes; but when it comes down to Melbourne it has to be discharged into the general warehouses or into some suitable dépôt, where it can be stored or kept till the market can take it off.

6224. Suppose the trade does assume large dimensions, would it be possible for the Railway department to provide a central receiving store?—I think so.

6225. You think trouble would arise if there were separate receiving places or some receiving places under municipal control?—I think that, with so many centres, this may arise—the nature and condition of the market may not be favorable to-day, and unless you can keep it till to-morrow the property may be wasted, and therefore, if the thing is to be, I suppose provision must be made for this storage in Melbourne, and there is no more convenient place than a railway dépôt where it is discharged; and we are quite prepared to make provision for it as soon as we see evidence that there is the traffic.

6226. Such facilities would, I suppose, include chilling-rooms, for the summer trade?—We have to get our experience of that, as to whether chilling-rooms are the best. We are trying to find out; we are giving some study and inquiry to the subject now, and I fancy we shall have to go by degrees till we know the best. Whatever is requisite, whether it is a chilling or a cooling room without artificial aids, we shall have to provide what is requisite, and the question of expense will not prevent us doing so.

6227. Have you determined what form of car you would use for the transit of dead-meat in a large trade?—There is a dead-meat trade in New South Wales, and I sent over to ascertain the conditions under which they were carrying it out, and the class of car they carried it in, and I found that the thing that suited them best was one with louvres—plenty of ventilation; no cooled air, but simply ventilation, and to keep the dust away from the meat; but they did not carry the meat very long distances.

6228. Riverstone was only 30 miles away?—Just so. We are building some, what we call refrigerating, cars; they are not that, because they have no refrigerating apparatus, but are so constructed that they can keep cool the longest. My belief is that the car for carrying this dead meat (and Mr. Palmer agrees with me) is the car that gives the best ventilation, and keeps the dust out of the car. The practice will be this: They will kill the meat to-day, say, and probably put it on to our trucks this afternoon, and it will be in Melbourne the next morning. It is travelling during the night; that will be the practical operation of the trade.

6229. In examining Mr. Richards, at Riverstone, he gave the opinion that it would be impossible in New South Wales to cover long distances of over 50 miles without some cooling arrangements?—I think we could manage that better here; our climate is more favourable. I do not, in fact, see any difficulty in running a truck for 150 or 180 miles. The trouble, of course, is in the hot weather; just now it does not matter.

6230. In the Orange and Bourke trade, in New South Wales, they stop in the summer?—I dare say that is so, but it is a question of going step by step, and if we find that one sort of car is not suitable we shall have to adopt another, but at present we are in a state of learning as to what is the best truck to adopt, and we are getting information as to that.

6231. Would there be any difficulty in modifying the cars to make the ventilated cars like the Tiffany ice trucks in the States?—Our trouble is about the ice. I went into a calculation the other day, just a rough-and-ready one, and found that it would cost as much in ice as we would get for the carriage of the meat; and it would not pay to carry the meat, because if we had to charge for the ice as well as the carriage it would place it at a disadvantage with the live-stock carriage.

6232. There was a calculation made in New South Wales, by live-stock firms, that for 200 miles with icing, it would cost 50s. a car?—That is 3d. a truck a mile, and we charge 7d. for live stock, so that half of it goes in ice at once you see.

6233. In your opinion, the cost of icing would be prohibitive?—I think if we can find a cheaper and equally as good a way of carrying the meat in good condition without the ice it is better to try that first, because, if we are compelled to go to ice, the cost will be such that it will retard the development of the industry.

6234. Have you thought of charging the cars with cooled air from stationary engines?—Not at present. We had a notion that we might do something with the air of the Westinghouse brake. We thought that if it was necessary to resort to some other means than the ordinary ventilated vehicle, we might utilize the air in the Westinghouse brake, but it is at the stage of consideration, so that I cannot tell you whether it is feasible or not.

6235. As to the amount of handling of meat that is required, would it not be well if there were some kind of direction given to persons about to start killing up country that would guide

Richard Speight,
continued,
9th Oct. 1888.

them as to the height that they should have their running gear, to minimize the amount of handling in the transport of meat, as they are establishing in the Sydney meat market, having all the bearings on which the meat is hung in the trucks on the same level in the running cars as the bearings in the markets?—I should say that would come as a matter of course, and I should say that Mr. Palmer, in building his slaughtering places, will so arrange them that when the truck goes inside it will be pretty well where the meat is hanging, but those are points that would naturally receive attention and be met.

6236. So often little things in a new industry go wrong, and the cost of putting them right puts the industry back?—I quite can see this, that if people have to be putting their hands in their pockets constantly it would send the business to the wall; but we consider all those things in the way we are now doing, and agree what is the best thing to make the thing a success. We do not look upon this dead-meat business as competing with the live stock, but as a section of the business of the country that has to be dealt with the same as any other business. It may tread on some one's toes, but we have to encourage it if it requires it.

6237. If it be deemed advisable to remove the abattoirs and cattle-yards from their present position to get them thoroughly outside the inhabited metropolitan district, could you suggest any place which would be suitable from a railway standpoint for the concentration of the live-stock trade?—I think there are suitable sites that are capable of being selected, and that would afford more room for the future development than where the accommodation now is; but, of course, I know what the view of the stock and station agents on the subject is. They have a fear that the further they go out there will be a duplication of markets, and, as they cannot be in two places at one time, there would be a duplication of agents. Of course, I do not like to mention localities, because it might give a point to a place that I should not be justified in doing; but, as a practical thing, it is quite feasible to find a place with plenty of spare room about it, and away from habitations, and sufficient for future extension, and having plenty of facilities for getting to and fro, and concentrating all the live stock in one place. It is quite possible to be done.

6238. Is there a place not too low-lying?—Yes, and favorable for drainage.

6239. And with a fair passage of wind?—Yes. I do not want to mention any name; but if we were told to find a site, we could find one that would have those requisites.

6240. I notice the ears used in the States are about twice as large as the ears here?—Yes.

6241. Is there any advantage here?—They began in the States with railways made on a rough sleeper, and they had to make the rolling-stock to run over that as smoothly as possible, and they adopted the bogey pattern of truck. The advantage of the bogey truck is where you have a big traffic; but, if not, you have to carry dead weight without its being paid for.

6242. You said just now that meat might be carried 180 miles?—Yes.

6243. If Mr. Palmer got his killing establishment, and he killed on one day, the meat would come here the next morning. Do not you think meat would get bad in that time in the hot weather?—I do not think so, not with a properly ventilated truck, and it is travelling during the night.

6244. Yes, but you must remember that the meat would be killed in the day time?—Yes, they would kill in the morning, and begin to load up after dinner, between two and four or three and five. They would have to fit in that way, and then it would be travelling all the night.

6245. That would be pretty well eighteen hours before it came into the market from the time it was killed?—Yes.

6246. They find at Orange that they cannot carry meat in the summer time, and that is about 150 miles from Sydney?—I do not think the climatic conditions in New South Wales are like those at all here. I think meat would go quicker there than here. I know I go quicker when I am in Sydney than here.

6247. But you are not dead meat by any means?—I feel the difference.

6248. Orange is a cool place?—But when you get within 80 or 90 miles of Sydney you get it warmer. We none of us can tell how far this will be a success, and with the immense facilities there are in Great Britain, and the favorable climate that they have for carrying that sort of traffic—as, I tell you, there is not one-third, at the outside, that goes to London dead—so that with all those favorable conditions I do not think you can make the proportions greater in favour of dead meat here than it is at home. You will never obliterate the live-stock trade.

6249. The most untoward aspect of the question is this:—The Richards', when they begin to kill in the evening, are able to get their killing finished by one o'clock in the morning, and can get meat into Sydney by a special train, but when they had not a good effective train service they just used ordinary cars, and the meat used to go bad?—Yes, we are quite alive to this, that we will have to work this dead meat with almost passenger expedition.

6250. That is clearly understood?—Yes.

6251. You could do that with a very small increased cost?—We shall fix our rate with some relation to what we charge for the live beast, considering the services we render and the special provisions we have to make, and we know there is a limit.

6252. So far as the railways are concerned, you could take live stock or dead stock at pretty well the same price?—I do not say that. There is a lot of refuse comes by the live stock which pays the same rate; it will be something over. If you take the live stock truck, 2s. 6d. per truck per mile against 7d., that is the present difference, but the chances are instead of it being 2s. 6d. it may be something between 7d. and 1s.

6253. Mr. Palmer told us that they could put a greater amount of dead meat into the trucks than live?—Yes, then they can afford to pay more per truck. I would not undertake to carry the dead meat at the same rate as the live stock.

6254. Would not the extra cost be more than counterbalanced by the absence of the detriment to stock by injuries in transit?—I have just been contending that they do not receive much injury in transit. Richard Speight,
continued,
9th Oct. 1888.

6255. We have noticed a good many animals damaged in railways?—You have noticed statements.

6256. Meat we have seen hanging has been more or less injured that has come alive?—They get a great deal of knocking about before they commence the railway journey, and many are in a semi-wild state, and violence is used by people in getting them in, and it is then the damage is done.

6257. That would be saved?—Yes, that goes without saying, that a beast killed at the commencement of the journey, and hung in the trucks, is not liable to the same injury that the live beast would be.

6258. I suppose your experience would lead to your saying that any excessive handling in the dead-meat trade is simply rubbish?—There is nothing in that. The bulk of the meat that is carried at home is wrapped in cloths, and put in meat hampers. Seven-eighths of the London meat is carried that way, but that is all the choice pieces. They have in the English and Scotch towns a community to consume the inferior portions of the beast. You would not have that advantage in those country places where you established slaughtering depôt—you would have no local centres—whatever you kill you must send to your market. In the British market, you have this local consumption assisting in your supplying the metropolis. You get some one to buy the inferior portions on the spot.

6259. Are the inferior butchers in London chiefly dependent on the local killers in London?—Yes.

6260. As a fact, nothing but good meat is sent dead to London?—The very best.

6261. Is there any particular reason for that?—I think it is they find the best market; it is a mere question of supply and demand.

6262. And apart from London, picking out the best meat, it finds it best to kill for itself?—Yes, two-thirds they kill for themselves, and three-fourths of the other third is the choice pieces.

6263. Is there anything else you think you could state on this subject that would help us?—All I wish to say is this—That so far as the establishment of those up-country slaughtering places is concerned, I see no practical difficulty in the railway transit part of the question; and as far as we, the Railway Commissioners, are concerned, we shall be very glad to afford every facility in the matter of rates or in the matter of convenient cars for the transit and proper reception rooms when it arrives at the station to encourage and develop the trade. That is our intention, and I do not see any practical difficulty in carrying it out; but as to whether you can altogether supply Melbourne with dead meat, and have no live stock, I do not think you will ever manage that.

The witness withdrew.

Joseph Miller sworn and examined.

6264. *By the Commission.*—What is your address?—(c/o G. G. Brown & Co.,) 32 Collins-street west. Joseph Miller,
9th Oct. 1888.

6265. What is your occupation?—I am a sanitarian and commission agent.

6266. By sanitarian, do you mean you do sanitary work?—A little, not on a great scale.

6267. You have made a request to be allowed to give evidence before this Commission?—Yes.

6268. You have prepared your evidence in the form of a written statement?—Yes—[*reading the same, as follows:—*]

“I have been interested in the management of abattoirs since boyhood. For many years in my native town of Grantham, in Lincolnshire, I made use of the blood and refuse of two butchers’ slaughter-houses in the town for manure. In order to make the removal of these matters inoffensive, I invented the following efficient disinfecting compound:—

| | | | | | |
|----------------------------------|-----|-----|-----|-----|----------|
| Desiccated spent tanners’ bark * | ... | ... | ... | ... | 112 lbs. |
| Portland cement | ... | ... | ... | ... | 28 „ |
| Chloride of zine | ... | ... | ... | ... | 0½ „ |
| Decomposed sulphate of iron | ... | ... | ... | ... | 1 „ |

These slaughter-houses were in the middle of the town, in close proximity to dwelling-houses, but never caused the slightest nuisance, because they were kept scrupulously clean, were well-drained and ventilated, and the above disinfectant was freely used. The floors were paved with brick, with a good fall to the drainage-pits. I think abattoirs should be constructed on a good sound foundation, and every stone or brick of the floor laid in cement of the best quality, or in asphalt. The buildings should be above the grass-line, but should have apartments below this for the reception of refuse. They should be fitted up with refrigerating and flushing apparatus. If properly constructed it is immaterial how near abattoirs are to a city. I possess the plans and specifications of a furnace for fat-boiling pans which consumes its own smoke and the ill odours from the fat. It was devised by my father, in 1794, and was in use in the heart of the town.” †

6269. Is there any further matter you desire to state to us?—No, I think not.

6270. Has it never been patented?—No; my father could not go to that expense, and he died before anything of that kind was attempted, and I have never introduced it in this country; and I think of taking out a patent for it in all the colonies. ‡ The idea is, that it consumes all the smell and all the nasty odour that you notice in going past Footscray in the trains, and which is so abominable to ladies.

6271. That consumes the smoke entirely?—Very nearly so. It is what you may term a good old system of consuming smoke and the steam from boiling-down vats.

The witness withdrew.

* In Victoria, lignite ground into powder would be good as it would take up the free ammonia quicker and retain it.

† Also used in Nottingham, Leicester, Bedford, London, and Birmingham, &c.

‡ I would prefer to negotiate for it with the Government, as I am too poor to take out a patent for some time to come.

TUESDAY, 23RD OCTOBER, 1888.

Present :

Professor H. B. ALLEN, in the Chair ;

W. McCrea, Esq., M.B.,
A. P. Akehurst, Esq., P.M.,
C. Hodgkinson, Esq., C.E.

T. M. Girdlestone, Esq., F.R.C.S.,
R. Reid, Esq.

Frederick James Gomm sworn and examined.

F. J. Gomm,
23rd Oct. 1888.

6272. *By the Commission.*—You are the town clerk of Footscray?—Yes.

6273. In February last, I believe a deputation, in which the borough of Footscray was represented, waited upon the Premier with regard to the removal of noxious trades from the neighbourhood of Footscray?—It was some time in the beginning of the year.

6274. They suggested that if the Government could see no way of taking immediate action for the removal of those trades, a Commission should be appointed to inquire into the subject?—Yes.

6275. What is your own opinion with regard to the present condition of the metropolitan abattoirs as affecting Footscray?—They pollute the river to a very great extent, and so cause a nuisance. The abattoirs are not within our boundary.

6276. Do you attribute any offence to the present condition of the abattoirs as affecting the ratepayers of Footscray, apart from the pollution of the river?—I could not say.

6277. In your opinion, should such pollution of the river be prevented by the complete removal of the abattoirs to some other site, or could it be prevented by some less drastic measure?—The pollution of the river should be prevented ; there is no doubt about that.

6278. Are you prepared to give any opinion officially as to whether removal of the abattoirs is necessary?—I know nothing about the abattoirs.

6279. Turning to the noxious trades in Footscray itself, what are the chief trades to the presence of which in Footscray objection is taken?—The bone-mills and slaughter-houses. There are two bone-mills on the Saltwater River, and there are two private slaughter-houses; they are a very great nuisance.

6280. Is objection taken to any of the other trades?—No, I have not heard an objection to any of the other trades. There are tanneries, fellmongeries, sugar works, and other works, but the principal objection is taken to the bone-mills and slaughter-houses, because they pollute the river to a very great extent.

6281. Do you object to the presence of bone-mills on any other ground?—Yes, they are a nuisance to the place and to the residents. Whenever the wind blows from the north, north-east, or east, it is impossible to keep the doors and windows open. They are very detrimental to the progress of that portion of the town lying between the Williamstown Railway and the river.

6282. Have you any reason to believe the presence of these trades is injurious to the health of the inhabitants?—I could not say.

6283. Have any cases of ill-health distinctly traceable to them been brought under your notice?—I could not say. The health officer is better qualified to speak on that matter than I am.

6284. He has not complained to you?—Not on that point. He has often complained to the council of the nuisance, and advised that strict measures should be taken to abate the nuisance.

6285. Taking, in the first place, the manure works and bone-mills in Footscray, do you think that their present offensive condition, to which you have referred, could be in a large degree removed by a more stringent supervision?—I think so.

6286. Why, then, is this partial remedy not applied?—I do not know. The local board of health have taken steps on more than one occasion against the proprietors—against both the bone-mills—and have obtained convictions against them, but these proceedings are very expensive, and they do not feel inclined to spend much more of the ratepayers' money in such a manner. It is an expensive mode, and then it is difficult to prevent the pollution of the Saltwater River; the Yarra Pollution Act does not protect the tributaries. I may say we are now framing a bye-law to prevent the pollution of the Saltwater River within our boundaries. Mr. Hodges is settling the bye-law, but, owing to technical difficulties, it is not yet ready.

6287. Take an explicit case—could not your council stop such an offence as arises at Cuming, Smith, and Co.'s from those large accumulations of refuse that have evidently been gathering together for many months?—I have not heard of any large accumulations. No formal complaint has been made to the council against that particular establishment.

6288. Have you visited that place lately?—I have not.

6289. I may inform you there are accumulations of refuse there, that in a very crude fashion were undergoing the process of drying, and when those accumulations are spread out in the open a very nasty odour arises?—I am not aware of that. I know a very strong smell arises from the bone-mills, but the part of the town where I am residing would not be affected by the smell from Cuming, Smith, and Co.'s; so cannot speak from personal knowledge.

6290. Are you aware they have found it necessary to import new machinery to remedy this evil?—I am not aware that it was in consequence of this evil. I know they have imported machinery. I was under the impression it was for the manufacture of sulphuric acid.

6291. Are you acquainted with the condition of things at Hallenstein's tannery?—No, I have heard no complaint.

6292. You have not visited it to see?—No, I have not.

6293. Are you acquainted with the condition of some of the smaller factories in Footscray, such as Kepert's little tanning place?—No. If I had received information as to what questions you would desire information upon, I would have endeavoured to obtain more information upon these matters. I am not in the habit of visiting these places. The health officer and inspector of nuisances do that.

6294. Would you be surprised to know that at Kepert's little place there are accumulations of waste matter that have been accumulating for months?—I should be rather surprised to hear that. No complaint has been lodged with the council or the local board of health in connexion with the matter.

6295. Does your inspector wait until a complaint is lodged. Is it not part of his duty to look round for himself?—Yes.

6296. He surely could have seen what we saw the other day, if he opened his eyes?—I cannot say as to that. He has not reported to the council.

6297. The point I am coming to is this—if your board of health exercised its powers, and put slight pressure on these larger establishments, could not these grounds of offence be removed to a large extent?—We have spent a great deal of money; we have taken very expensive proceedings against Cockbill, and Blyth, Irvine, and Binney. The local board have spent as much money as they were justified in spending out of the revenue.

6298. Did your prosecutions fail?—No, we obtained convictions in both cases.

6299. Then how did you suffer expense?—You cannot take legal proceedings without expense. The costs you recover do not fully recoup you for your outlay. You are bound to lose money.

6300. As a matter of fact, the cost of these proceedings have deterred the council from instituting proceedings unless the cases were very glaring?—Yes.

6301. In your opinion, then, could a remedy be found for any of the existing offences, by more stringent regulations of the trades in their present site?—Yes. At least, when I say that, it transpired in court during the hearing of those cases that I have referred to that they could erect certain machinery that would almost render the establishments innocuous, or to a very great extent. In fact, they promised to do so at the time.

6302. Has their attention been repeatedly drawn to the necessity for erecting that machinery since the prosecution?—Their attention has not been drawn to it by me. I believe the inspector of nuisances has visited the place, and remonstrated with them, but for that I must refer you to him.

6303. Supposing, then, it were determined that these noxious trades should be removed, would your council entertain objection to their being grouped together on Coode Island?—I cannot say; the matter has never been submitted to the council in that light; but I think objection would be made. At the time that deputation waited upon the Minister, it was suggested that a site should be set apart somewhere in the neighbourhood of Point Cook, I believe, with a branch line from the Geelong railway.

6304. On Crown lands?—I do not know if there are any Crown lands there or not.

6305. Is it not the duty of the inspector of nuisances to report to the council such cases as have been referred to here?—Yes, certainly.

6306. If it was, then what is the reason he did not?—I cannot say; it is the first I have heard of it. He has not reported it.

6307. One place was in such a state that one could hardly pass along the path in an ordinary way without observing it, to say nothing of going in to look. It would attract the attention of any ordinary passer-by?—I may mention that the inspector called the attention of the local board the other day to the state of the drainage at Michaelis, Hallenstein's, if you refer to that.

6308. I refer to the fact that very crude methods of drying things are adopted—frame-works put all over the ground, and the fleshings put out upon them in a way that is unsightly, if not offensive. There was a want of care—old bundles of hair had been allowed to remain for years, when they could easily have been removed?—I was not aware of that.

6309. I do not say there is anything frightfully offensive about Hallenstein's, but there was a want of thoroughness in dealing with those matters. The point that impressed itself upon the members of the Commission was, that with a little pressure from the local board a great deal of this trouble could be removed?—The local board are most willing to assist in the abatement of these nuisances.

6310. With regard to the private abattoirs on the banks of the Saltwater River, should they be retained?—No; I think they ought not to be retained.

6311. What hinders their removal?—They are on private property—they are vested interests.

6312. What do you think should be done?—It is a very difficult matter to deal with. Our solicitors say it is a difficult matter to cancel a licence when once issued. These licences have been in existence for years. When they were granted, the place was not so thickly populated, and they were not so great a nuisance as they are now. I am speaking of the slaughter-houses now.

6313. If you think their existence is really injurious, is it not the duty of the local board to refuse the issue of the licence?—In one instance we refused to issue a licence, and were compelled to issue it. They took it to the Supreme Court, and it was held that, unless we could prove anything against the character of the person or the situation of the place, we could not refuse to issue it, and we had to do so.

6314. Could you not make such regulations, requiring proper appliances, proper drains, and proper general management of these private abattoirs, that they would find it to their interest to

F. J. Gomm,
continued,
23rd Oct. 1888.

discontinue operations there?—We have done that in a great many cases. We have taken proceedings several times against the lessee of one of those houses—Charles Alexander, of Collingwood notoriety. He has always managed to gain the day through some quibble or legal flaw. We have never been able to deal with him properly.

6315. You have not been able to show he has been the cause of an avoidable nuisance?—No; the greatest nuisance is the pollution of the river. We cannot deal with that, on account of the Yarra Pollution Act not dealing with the tributaries. I am quoting Messrs. Gillott, Croker, and Snowden's opinion.

6316. Then what general recommendation would you make to this Commission for the more effective suppression of nuisances?—That is rather a difficult question to answer. The general opinion down there is that special legislation is required—that Parliament should take steps in the matter. We are, to a great extent, powerless.

6317. With a view to their removal?—Their entire removal.

6318. In what way do the abattoirs pollute the river?—They run the garbage into the river.

6319. What do you call garbage?—The blood and offal.

6320. Are you speaking of the private abattoirs?—Yes.

6321. I mean the Melbourne abattoirs?—I do not know anything of that. They do pollute the river, but that is not within our district. Our health officer has never reported upon that; it is outside our boundary.

6322. You say the Melbourne abattoirs pollute the river. How do they do it?—The drainage. I cannot say what it is from personal knowledge.

6323. Have you noticed the pollution yourself?—No, I have not.

6324. Are these establishments—the slaughter-houses and the others—in the hands of private persons or licensees?—The licensees are in some instances the tenants. The land is not Crown land; it belongs to private persons.

6325. Then, if your suggestion that they should be removed were adopted, there would be compensation?—Those vested interests would have to be considered, certainly.

6326. Those people went to Footscray to establish those industries at a time when Footscray was as distant from Melbourne as Point Cook is now?—Yes, just so; the population was not so large.

6327. The population has grown round these noxious trades all the time—they have put up with the inconvenience of having to shut the doors and windows, and progress has been made?—Not so much in this quarter of the town.

6328. It would be a hardship to compel those people to move without granting compensation?—Yes. I do not think it would be fair.

6329. Is there any feeling on the part of the people of Footscray against the continuance of these trades?—Yes, a very strong feeling.

6330. Has the subject of compensation been considered by the municipal authorities?—No, we are not in a position to entertain that.

6331. In the Municipal Act the authority is given to a municipal council to compensate persons who have to move?—Yes, but our revenue would not permit that.

6332. And you want to come on the country?—The country is in a better position to frame and enforce a law dealing with the matter.

6333. If these trades are a nuisance to the Footscray people, it is the Footscray people who ought to pay for getting rid of them?—We consider it is a public matter, not a local one. The main lines of railway pass these bone-mills, and people travelling to all parts of the country suffer this nuisance.

6334. The Local Government Act appears to consider it is the duty of the municipality to correct any nuisance in its boundaries; and if it becomes necessary to shift any of those establishments, it is for the rates of the municipality to pay the compensation?—It would exhaust all our rates for years to come.

6335. You are aware of that clause?—I am aware of that clause.

6336. That reasonable compensation is to be paid and given by the municipality?—We have never considered the matter in that light at all. We are not in a position to do so.

6337. Do you think, if instead of giving compensation an order could be issued that after a certain date the nuisance is to cease it would have any effect?—We have issued such orders, and endeavoured to enforce them; they still exist.

6338. Do these people have to get a licence from the council?—Yes.

6339. Could you not suspend the licence if they do not carry on in a proper manner?—Yes, we might try that course.

6340. If there are these fearful odours, should not the people of Footscray do the best they could before looking to Parliament?—We have done the best we can. We have spent a good deal of money in litigation from time to time. There is another thing—the nuisance is not altogether local. The Harbour Trust have prevented the nuisance within their boundaries, and we are trying to do the same within our boundaries; but the nuisance exists above us also—in Essendon and Flemington—therefore it is a general nuisance.

6341. The more general it is the more necessity for a borough like Footscray to set the law in operation as far as it can?—We have endeavoured to do so to the best of our ability.

6342. In the case where the Supreme Court compelled you to issue the licence, was it represented that the establishment was a nuisance?—Yes, it was represented that that was why we did not issue it. It was held that all we had to do with was the character of the licensee and position of the establishment.

6343. That applies to slaughtering licences?—Only to slaughtering licences.

6344. Is there anything to prevent your issuing an edict with regard to noxious trades, that after a certain date they must cease to be a nuisance, and if they continued to be a nuisance after that date withdraw their licence?—I do not know if we have that power.

6345. The noxious trades have not a licence strictly. They pay registrations fees?—That is all.

6346. If a man gets a licence, and continues to pay his fee, I do not know if the borough have power to cancel it?—No, we have not. The remedy was suggested that we should prosecute and prosecute until it became too hot for them, but that is rather an expensive process; more so than we could afford.

6347. No doubt, it is very discouraging work. In a great many cases the magistrates will fine a man 20s., and give the council 20s. costs, and they have been put to the expense of ten guineas for bringing a solicitor out from town, and witnesses?—Yes, we have paid ten guineas for a medical certificate.

6348. Do you think it would be a good thing if the council had that power to withhold a licence?—Yes; I think so.

6349. If people had power to appeal to the Central Board, they could very quickly set some of those places in order?—Yes.

6350. You said the garbage from the private abattoirs went into the river?—Garbage and offal.

6351. What does the offal consist of?—That I could not say; I have not inquired into that. Our health officer could satisfy you about that.

6352. What is it you mean by garbage and offal?—Some portions of the animals are washed down through the drain into the river. These drains are supposed to have catches to stop the flow into the river, and they do lower these catches when anybody is about; but when his back is turned the catches are raised, and the whole is swept into the river.

6353. That is something beyond the blood?—Yes, paunches.

6354. Intestines?—I do not know myself. I am speaking of what the health officer has informed me from time to time.

6355. You have had formal reports to that effect?—Yes. At any rate, I have had verbal reports, if not written ones.

6356. Does your inspector act under any specific directions, other than the bye-laws?—No.

6357. Has he any directions from the council as to what he should do, or should not do, as to the manner in which he should carry out his work—as to reporting, or keeping a note-book?—He reports fortnightly, and in a glaring case he reports at once, and gets instructions to act. In certain cases, he has power to act without special authority, and he takes steps; we instruct him to do so.

6358. And he does do it?—He does do it.

6359. Do you desire to make any further statement to the Commission on this matter?—I do not think I can give you any further information.

The witness withdrew.

TUESDAY, 20TH NOVEMBER, 1888.

Present:

A. P. AKEHURST, Esq., in the Chair;

Professor D. Orme Masson,
C. Hodgkinson, Esq., C.E.,

W. McCrea, Esq., M.B.

Richard W. Kitchen sworn and examined.

6360. *By the Commission.*—What is your occupation?—I am at present an estate agent, and have been for years. My profession is civil engineer. R. W. Kitchen,
20th Nov. 1888.

6361. You appear here to-day to give some evidence as to the noxious trades of Footscray?—Yes.

6362. You have offered to give some evidence?—Yes.

6363. We shall be glad to hear what you have to say?—Will you ask me some questions on the subject?

6364. What is your acquaintance with them?—Thirty-eight years.

6365. You have been resident where?—Melbourne and suburbs.

6366. Have you lived in Footscray?—I have lived there for the last eighteen years.

6367. Can you say whether, as a member of the population, generally you have experienced yourself any nuisance from the trades usually called “noxious”?—Yes, we have, from the boiling-down establishments, very considerably. I mean, by boiling down, where they make guano, and where they boil down the refuse from butchers’ shops.

6368. When is it principally noticeable?—When they are taking the material out of the vats to put it on the floors. It is so bad that you wish yourself out of the place.

R. W. Kitchen,
continued.
20th Nov. 1888.

6369. Within what distance?—We live within half-a-mile of one place, and within a mile of others. Mr. Cuming at one time did not make this manure from “hashmygandi,” which is what they call the “butchers’ refuse.”
6370. At what periods of the day was this principally noticeable?—It is not every day; but when they boil down they take all the fat out, and empty the vats. It is generally two or three times a week, very often on Sunday morning, about one or two o’clock.
6371. In the middle of the day?—The middle of the night; and the night is principally the time they seem to open the vats and take out the refuse.
6372. To what extent is this annoying?—It is a very disagreeable and disgusting smell.
6373. Sickening?—Yes, it is something after the same smell as if night-carts had passed down the street, and you got the effluvium just after it passed. In fact, it is almost unbearable sometimes.
6374. What other trades are there that are disagreeable?—We have not had any except those where they boil up meat and refuse from butchers shops.
6375. Have you visited those places yourself?—Yes.
6376. Have you anything specially to say with regard to them as to the way the business is conducted?—Yes, I know the parties very well—Irvine and Binney.
6377. Does anything strike you about their business?—That is, as to the smell, you mean. My opinion is, they cannot adopt any means to do it without making this smell. As far as I know, they use this cake salt (a refuse material made from the manufacture of muriatic acid) very considerably, and the more they use it the more expensive it makes the product.
6378. Anything they have tried, you think, has been a failure?—A complete failure.
6379. The whole of the establishments, as far as you know, are equally bad?—Yes, of the same kind. Those boiling-down establishments are all the same.
6380. Have you noticed any particular attempt on the part of any of them to minimize the matter?—Yes, they have all experimented, but it has been a failure always; as a rule, they boil down rotten meat to commence with. It is brought down there, and they have to boil it down to extract the fat, which pays them very well.
6381. Have you noticed the condition of the establishments?—The places are kept clean, I think.
6382. Have you noticed any heaps of refuse?—Yes, it is always in the place, spread on the floors and put in heaps of 30 or 40 tons.
6383. Is that kept a considerable length of time?—I could not say that. It has to be kept till they dry it, and then they grind the bones with the “hashmygandi” and the meat then called guano.
6384. Are there any other trades which are a source of nuisance?—The slaughter-yards are, in a way, as far as the river is concerned, but where we live, in Footscray, we do not feel the smell from the slaughter-houses. As a rule, the stuff is taken away from them quickly.
6385. Do you know anything as to the smell, when they are drying that stuff after it is spread out?—Then they cover it with this cake salt.
6386. Does it smell then?—Yes; that is the worst time.
6387. Is that left a considerable length of time?—It must be left till they take up all the moisture.
6388. Is it left after that?—I cannot say that. In fact, it is so bad that people will not live near it.
6389. What other trades are there at Footscray that have created a nuisance?—I do not know any. The slaughter-yards and the tanneries, but the tanneries have nothing bad in them. In fact, they are rather desirable than otherwise.
6390. Have you visited any of the tanneries from time to time?—Yes.
6391. What is the state in which they are kept?—They are kept pretty clean—in very fair order. There is nothing dirty or slovenly about them.
6392. Have you any suggestions you would like to offer as to the removal of those trades. You know the municipality of Footscray represented to the Government the advisability of removing them?—I think it would be a very good thing indeed to remove them. If they were away, it would mean doubling the population and trebling the price of land. The best part of Footscray, the original township, is almost deserted. I mean, by that, that there are not houses built there—there is too much spare ground.
6393. Unoccupied ground, you mean?—Yes.
6394. It is not the case that a number of houses in the neighbourhood of those trades have been abandoned?—No.
6395. Simply, the ground near them has not been built on?—That is it. There is a great quantity there. There is more on that side—the lower township ground—than the other side.
6396. Is that in consequence of the trades?—Yes.
6397. You have lived there for 18 years, and have known it some 30 years?—Yes.
6398. When you first became acquainted with Footscray, were there many trades?—No. Hayes had a place where he made a sheep-dip, and he built a large place; and on that site Irvine and Binney have their place.
6399. How did those trades spring up?—They came from the river originally; they got paid for coming here from the Harbour Trust or the Town Council.
6400. How long ago is that?—Ten or eleven years.
6401. Was that the commencement of the noxious trades?—That was the reason they came to Footscray; they were paid to come from there, and then Cockbill followed.

6402. Was there any objection or opposition raised by the inhabitants?—There were a great many who would not have anything to do with them, but others thought it would bring a lot of population, but the majority did not want them to come.

6403. Was there any attempt made to prevent their coming?—No organized attempt; simply ordinary town gossip that it was a bad thing they came.

6404. No formal objection or opposition?—No. In fact, at the opening of their place, they gave a little spread—I was there myself—and they said at that time they had appliances which would minimize the whole of the stinks from the place, and they would not cause a stink, and on those terms we could not object to their coming.

6405. Then for some time there was no objection?—No, not for a short time.

6406. Did not the council of Footscray rather encourage them than otherwise?—Yes, one portion did, but not the whole of them. I think the majority did.

6407. That was in the hope of their employing a large number of men, and bringing population, and increasing the rates?—Yes, that was the idea, but a very false one.

6408. There was no formulated opposition?—No, merely talk against it, but the council seemed to favour it—the majority of them.

6409. The majority of the council were in favour of that particular trade?—Yes, with the understanding, of course, that they would not make a nuisance, and, of course, we were deceived in that understanding.

6410. Is there anything you wish to suggest to the Commission by way of reducing this nuisance or getting rid of it?—I think the best plan is for the Government to indemnify them for it. Of course, we shall all have to go in the same proportion; it is for the benefit of the whole district.

6411. As the law stands at present, you know the council and borough can do it under their Act, if they want to get rid of a noxious trade, and to compensate?—I was not aware that they could do that.

6412. They have power under the Act to compensate a person they want to get rid of, and these trades, being such a nuisance to Footscray, why should not that course be followed?—In the first place, they gave £800 for the land, and now that is worth £2,000 an acre, and I think that is very good profit for them.

6413. That would show the compensation would be very little?—Yes, very little, to pay them.

6414. Then surely the council could easily pay; why should the country at large pay for it?—It is for the benefit of the whole country to move the nuisance, so that they will not be a nuisance to any body. They come like a firebrand into the midst of a municipality that is settled, and then they destroy it; whereas if they went to a distance, where no houses are, and people came round, no one could complain.

6415. You say there was a good deal of unoccupied land at the time they came, and it has remained?—It is on the opposite side of the river. The original township would be about 600 acres.

6416. In your judgment, through the increase in the value of the land, very little compensation would be payable?—Not any at all. I think the price of the enhanced value of the land would be quite sufficient. I have brought a plan to show the position of those places.

6417. To whom does the land belong?—To various people in the district.

6418. Not to the council?—No.

6419. Do the owners of the buildings own the land?—Yes, they own it.

6420. Then you cannot bring in the increased value as compensation. Do you remember McMeikan's place, a little further down the river?—Yes. That was a great nuisance, too, at the time. He did the same thing exactly; he boiled down this "hashmygandi."—[*The witness exhibited and explained the plan.*]

6421. Has not a special value come from using the land for manufacturing purposes; it is not suitable for residences?—No, it would not do for residential purposes at all.

6422. Is there anything further you wish to say?—Only that it would be a benefit to the district if they were away from it. I know plenty of manufacturers who would come down there, if they were away. Mr. Bevan, and his employé's of the carriage works, objects to it very much.

6423. Are you aware that in other parts of the world they have carried on those noxious trades without offence by adopting suitable appliances?—No. Do they use the same material as they do here, this "hashmygandi?"

6424. Yes, and in operating on it they do so as to cause no nuisance?—I was not aware that they could minimize the smell altogether from the rotten meat. I think that it is nothing else. When it is taken out of the vats they must have some means, and they have none; they have airtight vats and a shaft, and we get it from the shaft. I know of no means except chemicals, and that, I suppose, would destroy the manure. They use the cake salt largely to try to deodorize it. I wish very much to object to the slaughter-yards allowing the blood to run into the river; it causes a great deal of nuisance in the river about there; and then there is another thing, that drain, the cut canal from North Melbourne, that runs into Footscray into the very centre of the wharf. The nuisance from that is very considerable. When the tide comes back it brings the black mud back, and the smell is very bad. In fact, it is so bad that a gentleman with boats there cannot carry on business, and intends to sell out.

6425. Is that the Flemington Creek you mean?—Yes, the same one that comes through North Melbourne and down by the swamp roads—we call it the canal. Of course, now it is pretty well filled up.

R. W. Kitchen,
continued,
20th Nov. 1888.

6426. Is there a more or less constant offensive smell from that?—Always; it is always the same. I recommended some years ago that they put locks across it here and there, and when the tide was up stop it up, and when the tide went back flush it, but then it would all go into the river, though it kept the drain clear.

6427. That is principally house drainage?—Yes, it smells very foetid.

6428. Have you seen those works in course of construction by the city council for desiccating the blood?—Yes. I think there is an objection there; the chimney is not high enough. It is not as high as Footscray, even from the flat.

6429. Is it finished?—I think they are putting on the top now; it ought to be taken at at least 30 feet above the level of the township, because there will, no doubt, be a smell from that.

6430. Is not the chimney mainly for the machinery for the furnace?—Of course, there will be the gases from the burnt material that will escape through the chimney, and we should smell it in Footscray.

6431. You have not seen this Farmer's desiccator at work?—No.

6432. It appears to be quite possible to work them without any offence?—I should be glad of it; it would be a great thing for Footscray and the district. Of course, there is not a township in the colony so well situated for manufactories. We have the railways to any part of the colony, but people will not come there at all on account of the noxious trades.

The witness withdrew.

Dr. Charles Louis McCarthy sworn and examined.

C. L. McCarthy,
20th Nov. 1888.

6433. *By the Commission.*—What are your professional qualifications?—Bachelor of Medicine and Bachelor of Surgery, Melbourne University.

6434. You are the health officer of the town of Footscray?—Yes.

6435. How long have you held that appointment?—Nearly three years.

6436. Do you live in Footscray itself?—Yes; I have lived there six years.

6437. Three years before you were appointed health officer?—Yes.

6438. You are well acquainted with the various trades, and the nuisances complained of in connexion with them?—Yes, I am well acquainted with all the noxious trades in Footscray.

6439. Will you tell us from which of them the principal nuisance proceeds?—They are all very bad; it is only a matter of degree. If I singled out any, I would name the boiling-down establishments the so-called bone-mills.

6440. And very great offence proceeds from those, you say?—Yes.

6441. What efforts have been made by the occupier to minimize the nuisance?—From time to time various devices have been employed, and the last and most signal failure was drawing the whole of the nitrogenous fumes through the furnace and up the stack. That has been the most signal failure of all the experiments, for this reason, that hitherto, on blowing off all the vats, the smell went a very short distance about the town, now it goes out a great distance. The stack is 75 feet high, and the effluvium, in all its concentration, is spread over about six times the superficial surface it used to be, and six times the number of inhabitants suffer now than when it was in its old abominable state.

6442. When is this principally noticeable?—It is a constant feature of the works; it is always noticeable.

6443. Has any attempt been made to alter or reduce that in any way—the nuisance arising from the height of the stack?—No, this very attempt of the proprietors to draw the air from the vats through the furnace has been a signal failure, as regards destroying the smell.

6444. They have done nothing since that?—No. That has been their supreme effort; they thought by that means they would destroy all the smell, but it simply scatters it over a greater area.

6445. You do not think the influence of the furnace affects the smell?—No, not at all. It is opposed to our knowledge of chemistry. Nitrogenous fumes are not affected by fire; on the contrary, they would put it out.

6446. What are the other trades?—There is the gut factory, an abominable nuisance in its way; the abattoirs or the slaughter-yards (our two slaughter-yards), the glue works, chemical works, and smelting works.

6447. Are the last a nuisance?—They are. They are noxious.

6448. They emit poisonous gases?—I would not say poisonous gases; they are very disagreeable gases—sulphurous fumes.

6449. Any arsenic?—Yes, of course there are small percentages of arsenious acid, zinc, and antimony, together with sulphur.

6450. Are they working now?—Yes.

6451. Never a large quantity of arsenical fumes?—No, there is no occasion for complaining of the quantity of mineral fumes with the exception of the sulphurous fumes; they are pungent and disagreeable.

6452. Has any attempt been made, with regard to those establishments, to reduce the nuisance of late?—They have the latest and most scientific principles, and we cannot expect more of them. I find no fault with the pyrites works, except an occasional nuisance there of sulphurous fumes.

6453. What is the condition of the trades, apart from the smells which proceed from the conduct of the trade—the ordinary conduct of the trade?—The condition is very fair; they all try to do their level best to comply with the regulations imposed on them by the local authorities.

Their local arrangements are fair, but they are all badly situated, on low-lying ground—the place is absolutely unsuited for such works. The gut factory, and glue factory, and other noxious establishments that we have along the river certainly ought not to be in such a locality, taking the other circumstances into consideration—that is, the surrounding population. I do not mean to say that the river is a bad place for them, but the river, with all the surrounding circumstances, is a very bad place for them.

6454. Has there been any opposition to the establishment of any trades on the part of the inhabitants?—There is a constant opposition. No noxious trades have been established since I took office.

6455. It is simply a recurrence of objections from time to time?—Yes; people are constantly complaining, and with very good reason. I am confident there is no part of this colony inhabited that suffers from such an amount of vitiated atmosphere from noxious trades in its midst as Footscray.

6456. Are you aware, as the health officer and a professional man, to what extent the health of the inhabitants suffers from the smells, as distinguished, I mean, from the annoyance?—Well, from a professional point of view, the health of the inhabitants is affected to this extent—the weakly, and the suffering, and the convalescent do not get on well under treatment while they are within smell of those trades. The result is, the medical adviser has to get them away for change of air. It is the only means by which the adult population passing through the convalescent stage can get on; otherwise improvement is prevented absolutely. There is no question about that—that is, the people immediately within the influence of those smells—that is, people living in the old Government township, that part lying between the railway line and the river.

6457. As to children?—Children suffer appreciably, especially in the hot weather; they fall off in their appetite, and seem to be disgusted at the very sight of food. Children beyond the influence of those smells and people away from there do not so suffer.

6458. Is there any specific ailment?—There is no specific ailment following as the result of the trades; but there is a well-marked train of symptoms attendant on weakly people, and children and females. Females suffer very considerably from the offensive smells.

6459. Are not the employés at those noxious trades and their families remarkably healthy, as a rule?—Yes, because it is only the healthy and strong men—animals—that can stand it; the average constituted man could not stand it; it is only the very strongest types of the human race that can stand it.

6460. What about the families?—Those that are there now suffer. I know that to my cost, in the matter of my lodge patients; they are always suffering for no good reason but that.

6461. The system is generally weakened?—Yes, from inhaling this vitiated atmosphere, so that they are less able to resist disease, and less able to recover when they are suffering.

6462. Have there been any marked outbreaks of disease since your knowledge of Footscray began?—No, no marked outbreak of any specific disease. We have had our epidemics of measles, and whooping-cough, and so on.

6463. Typhoid?—We have had a fair share of typhoid.

6464. Nothing that you would connect in any way with the trades?—No, it is not altogether—there is no particular disease connected with the trades—as the outcome of the smells created by the trades, but the unhealthy, weakened, miserable condition induced in the people living within the influence of those smells.

6465. Is there anything further you would like to add?—Then there is the state of the Salt-water River—it is a menace to the health of the inhabitants—it is a big sewer. I suppose thousands of fetuses from the slaughter-yards are annually thrown into that river, and on the average there is something like between 150,000 and 120,000 gallons of blood emptied into it annually from the two slaughter-yards, and thousands of tons of offal and hundreds of the stomachs of slaughtered animals lying festering about. It goes down the river, and is met twice daily by the tides and driven back to the bend in the river, between Hopkins street bridge and the railway bridge.

6466. What efforts have been made to check that?—I believe they are now passing a bye-law to prevent the abattoirs and other places from emptying so much animal refuse in there.

6467. That is surely a specific ground of complaint that might be stopped absolutely?—I do not know that it will be so easily stopped. I had the satisfaction of hearing yesterday from the interested noxious-trades owners the moment it becomes law they will appeal against it, because it strikes at the root of their trade, and it is only just, from their stand point, that they should be allowed to do it.

6468. There is no reason why the proprietor of a slaughter-house should be allowed to send down all this filth of sheep and matter festering, as you describe?—There is no reason why it should be, but the slaughtermen think there is.

6469. Why do not the local board check it?—We cannot check it until this bye-law comes into force. It cannot be checked; we have no control over it.

6470. You speak of the Footscray abattoirs?—Yes.

6471. Not the Flemington?—No. I am confining myself to the local abattoirs.

6472. I suppose if that state of affairs were allowed to continue, you would not be surprised, as a medical man, to have a great outbreak of disease that might decimate the population?—Exactly; that is what it is coming to. The river is actually silting up from the amount of offal, and filth, and blood put in it.

6473. Have they no means to dispose of that except putting it in the river; do they bury the contents of the paunches?—They bury a very small portion of it. They bury it when they know

C. L. McCarthy, the inspector of nuisances is coming; but otherwise they shoot it into the river, and do it before our eyes, and they defy us.

6474. That is a state of things that wants to be dealt with very soon. What else is there as to the river?—Well, of course, the bone-mills empty their fluids, principally gelatine—the liquid extract of the steamed meat—that is a very stinking material when it runs into the river. That runs direct from the boiling-down establishment into the river.

6475. That is distinctly offensive?—Yes.

6476. Of course, that can be checked under the Health Act, as it stands at present?—I do not see that. We have tried it over and over again. We have no control over the river.

6477. But before it gets to the river?—They take care it goes through covered drains.

6478. It is in the power of the council to open the drains?—We cannot interfere with their drains; we cannot unearth nuisances. We can only deal with what is apparent.

6479. That is a limited view to take?—That is our sad experience in the matter of prosecuting those people.

6480. It does not follow that some might not succeed. Besides the slaughter-yards, there are other establishments or trades that contribute to the pollution of the river?—The bone-mills, and the gut factory. Of course, the tanneries contribute a certain amount of pollution, though it is only expended tan, the liquor that they tan the hides with. It is pollution, to a certain extent. It is not very noxious—nothing like so bad as the animal matter from the other places.

6481. What is your opinion as to the way the tanneries are kept, apart from any trade nuisances?—The tanneries are kept very fairly. They appear dirty, but there is nothing offensive or noxious in them. They allow certain tailings and things of that sort to lie about, but those are so effectually treated by lime and other materials, that they do not give out further effluvia.

6482. Are they allowed to lie too long?—Yes, but no offensiveness ever arises from that, because it is so well treated with lime we cannot say it is noxious. They compel them to remove that. There is no perceptible smell, though it looks ugly.

6483. What is the infantile mortality in Footscray as compared with other towns?—I could not contrast it with the infantile mortality in other towns, but I can tell you we lose 23 or 24 per cent. of all the births registered in the town.

6484. You cannot say how that compares with other manufacturing towns?—No.

6485. Can you connect that with the nuisances arising from the trades?—I have already stated, in my opinion, to a very great extent, I will not say in the matter of new-born infants, but infants and children all under five years suffer very severely in illness, and in health also, from the offensive, pungent smells. For instance, in hot weather, the people cannot let a breath of fresh air into their houses, because of the pungency of the disgusting odours with which the whole air is saturated from the trades. The windows and doors have to be kept closed. Children are then, two or three in a room, left all night sweltering in the heat of summer, and it is only fair to conclude the health suffers.

6486. As to zymotic diseases, how do those compare in Footscray with other towns?—There, again, I cannot contrast. I was not prepared to answer questions of this sort. Our zymotic death-rate last year was:—Four deaths from measles (our population is nearly 12,000), five from whooping cough, eight from diphtheria, and we had fourteen from typhoid fever; of those fourteen, 33 per cent. were cases imported into the town, persons who died in the town, but who came from up the country to be near medical aid. This last typhoid season, that is the eight months from October to May inclusive, we have had only five deaths, two of which occurred in the case of persons who came from up the country with the disease to be treated at Footscray. I consider we stand very favourably as regards zymotic diseases.

6487. Is there anything further that occurs to you in your experience as health officer?—There is nothing, I think, except, of course, those noxious trades have in a great majority of instances done all they possibly could to diminish the smells and noxiousness of their works, but they have been a signal failure, and I am convinced that there is no practical and economical means by which the smells of those establishments can be thoroughly done away with. It is all very well to say that other towns in the old country do away with their smells; I know they do. I know, in Chicago, my friends tell me, they do not smell in the least, but our climate is very different. They do not get the same amount of rotten meat that we do here, and that is the secret of all our trouble. They boil down fresh meat, we boil down rotten meat; the two things are totally different. The smell of the fresh meat is rather pleasant, but the smell of the other is simply an abomination.

6488. Is there much difference in the smell in hotter and colder weather?—Very little, because the refuse from the butchers' shops is not sent till it is rotten and unfit for use. They scarcely boil down any other than that, and a very little decomposed meat boiled down goes a long way in creating a smell.

6489. Do the Footscray people drink largely of water collected from the roofs?—No, only in a very few cases. They did some years ago, in the vicinity of the pyrites works, but they very soon found out the danger connected with arsenical poisoning.

6490. It is only Yan Yean water that is used?—Yes.

6491. Is there anything further you wish to say?—Of course, the glue works are an abomination, and also the gut factory; they are on a small scale, but they create their share of the smell and annoyance to the town.

6492. Is there much floating trade on the river just now, lighters and so on?—Yes, in connexion with the factories, there is a good deal.

6493. What is the health of the people on board those vessels?—I have nothing to do with them; I have not noticed them; but, as a matter of fact, those persons working in those places are men of iron constitutions. A weak man goes to the wall there very soon, and gives it up. It is no argument in favour of the noxious trades, to point out the condition of those men's health; the majority of them, I know, never will ail till they die.

6494. Is this rotten meat delivered by carts?—Yes, mostly by covered carts from the city along the Swamp-road. Then, of course, there is this West Melbourne canal; that is also a source of nuisance. We get the whole sewage of all those northern suburbs, North Melbourne and those places; it floats down the canal, and gets into the sluggish river, and is there dammed back by the tides, and we get the benefit of it.

6495. Is there no possibility of the corporation preventing the rotten meat coming in, as it is known to be a risk to health?—No; we have no means, by bye-laws, to prevent the importation.

6496. It is not specially offensive during the time it is passing through the town?—Scarcely. If that were the case, we would also stop the night-carts going through the town—one is just as absolutely necessary to go through the town as the other.

6497. Hardly. You might make them destroy rotten meat on the spot. The rotten meat need not necessarily come through?—We make no complaint of the way it comes in the town; it generally comes in at night, and covered over, and it does not trouble the inhabitants, or their sense of smell, or their agreeable living.

6498. Have you anything further to add?—Nothing further.

The witness withdrew.

Adjourned to Tuesday, 4th December.

TUESDAY, 4TH DECEMBER, 1888.

Present:

Professor H. B. ALLEN, in the Chair;

W. McCrea, Esq., M.B.,
C. Hodgkinson, Esq., C.E.,
A. P. Akehurst, Esq.,

Professor D. Orme Masson,
T. M. Girdlestone, Esq., F.R.C.S.
J. Campbell, Esq.

William Davidson sworn and examined.

6499. *By the Commission.*—What is the title of your office?—Superintending Engineer, Melbourne Water Supply. W. Davidson,
4th Dec. 1888.

6500. How long have you held that office?—Nearly eleven years.

6501. This Commission desires to obtain information from you in the first place in reference to the following point—are any portions of land within the catchment area of the Melbourne Water Supply alienated from the Crown?—Yes. There is a total of about 1,300 acres, or possibly 1,400—speaking from memory.

6502. Whereabouts are those tracts of land situated in the area?—1,200 acres are within the immediate catchment of the Yan Yean reservoir, as distinguished from the Plenty watershed, and drain directly into the reservoir.

6503. On which side of the reservoir are those portions of land that drain directly into it?—On the north and south banks, on the extreme northern, and along the southern margin.

6504. What is the present condition of those two tracts of alienated land?—They are grazing lands; cattle and horses, and occasionally I see sheep running over them.

6505. Is there any provision now existing for intercepting the drainage from those grazing grounds to prevent its passing into the reservoir?—None.

6506. Do dogs, in any number, run about those grazing grounds?—No. Occasionally one sees a dog, but not frequently.

6507. The presence of dogs within those areas is only of occasional occurrence?—That is all.

6508. Are there any instructions given to the keepers with regard to the destruction of dogs within those areas?—Not so far as the alienated lands are concerned, but within our own fences, which form what I might call the inner boundaries of the alienated lands, we kill dogs if we get them there, and geese, and sheep, and such animals.

6509. Is it within your memory when those lands were alienated?—I know, as a matter of fact, that in the immediate vicinity of the reservoir they were alienated long before the reservoir was built; I think as far back as 1844.

6510. Is it within your knowledge that it is proposed to break up any part of those alienated lands into smaller allotments?—Yes; we have communications from the proprietors to that effect at the present time under consideration.

6511. Do you think that great danger to the purity of the reservoir is entailed by those proposals?—I think certainly that settlement on the slopes running into the reservoir would be a source of pollution if the drainage from the residences cannot be intercepted and carried away.

6512. Do you think it would be safe to allow settlement in those tracts of land, granted that certain provision is made for interception of drainage?—I think it cannot be made safe. It seems to me if this projected settlement takes place it is merely a question of the Government resuming the land for water supply land, or constructing such works as will prevent any pollution of the water in the reservoir from such settlement; that, I think, is possible to be done.

W. Davidson,
continued,
4th Dec. 1888.

6513. What is the proper course to pursue?—To resume as much of the land abutting on the present property of the Board as will contain a large catch-water drain of sufficient dimensions to carry off not only the ordinary drainage from any possible settlement, but all water falling on this area and draining into the reservoir. I have had such a drain surveyed within the last four weeks, with a gradient of 3 feet to the mile, and at a certain point I find it is easy to conduct the whole of this polluted surface water from outside the catchment area by a tunnel through the spur which forms the western boundary of the lake.

6514. Do you think the results so obtained would be thoroughly satisfactory so as to put out of court the necessity for resuming the whole area of the land?—Of course it would be preferable to have all the land, and keep the settlement as far away as possible, because, even though we may intercept the drainage, we cannot prohibit people from coming inside the catchment if they live in the neighbourhood; but that would be such a costly thing. I think the interception of drainage the next best thing.

6515. Would not the loss of the rainfall on 1,200 acres of the present area be a serious matter?—I do not think so. It is not water that we depend upon much, at any rate; it is not very good ground for shedding water.

6516. Are there any houses at present on this alienated ground in the vicinity of the reservoir?—There are two on this 1,200 acres I speak of—two dairy farms.

6517. How long have they been there?—I think before the reservoir was built; in fact I am sure it is so from what I have heard.

6518. I understand that the only other areas of alienated land are further up in the catchment area round the Tourorong reservoir?—Yes.

6519. What extent of land is there alienated?—I think the portions that drain directly into Tourorong must be about 200 acres; they are marked pink on that plan.

6520. There is a large tract on the north-western side of the reservoir, and a smaller tract on the south-eastern side?—Yes.

6521. What is the state of that land at present?—That on the north-western side is in its primeval condition, just as it was 100 years ago.

6522. Bush, with no habitations?—Yes.

6523. What is the state of the smaller patch on the south-eastern side?—It is timbered land; it has never been cultivated or cleared.

6524. Are there any habitations on that south-eastern patch?—There is one small cottage, occupied by our reservoir keeper, round which there is a drain to divert anything from the house below the embankment. We are going to build him a new house below the embankment altogether; we have not had an opportunity yet.

6525. Is grazing allowed within those areas?—I do not think any grazing is being done on the north-western side. I do not think that land is being applied to any uses. On the south side it is a grazing farm.

6526. With regard to those two dairy farms, are they to the north or the south?—On the north.

6527. Is there any provision for their drainage?—None whatever.

6528. It tends ultimately towards the reservoir?—They are removed some distance from the water, but their drainage has a tendency to gravitate towards the lake.

6529. How far are they from the lake?—One house is about a quarter of a mile, and the other half a mile, from the water.

6530. I understand that, with those exceptions, the whole of the catchment area is permanently reserved?—Yes.

6531. Are there no farms at the fringe of the catchment area, or no alienated land?—No, all Crown lands, and all unsettled.

6532. Would it not be desirable, looking at the future, to get rid of those people altogether?—I certainly think so; but it is a matter very much to be deplored that that land was not resumed when the reservoir was first contemplated, when it could have been had for a song; now it would cost us certainly £100,000 to buy the ground.

6533. That is the valuation of the owners?—Judging by the rates at which land has been recently selling up there, I made up a calculation the other day that we could not expect, at recent rates, to get it for less than £96,000. Land has been sold there up to £160 an acre. If we had bought it twenty years ago, when it might have been obtained for, say, £10 to £15 an acre, it would have been a very proper thing to do; but I am afraid it is too late to think of that now.

6534. Passing to the catchment area of the creeks recently brought in from the northern water shed, is all that catchment area reserved?—Yes.

6535. Do any farms drain into that?—No, no private land whatever.

6536. Then the wood cutters are cleared off?—Yes. It is all solitary.

6537. Are any ordinary splitters' licences granted within the catchment area?—None whatever, and have not been for nine years.

6538. Will you now, in the next place, state what is the difficulty which has arisen in regard to the saw-milling industry in relation to the catchment area?—The difficulty that has been referred to lately was in connexion with the Watts watershed—not the Plenty. We are spending half-a-million of money in bringing the Watts water into Preston for the use of Melbourne. The whole of the Watts watershed has been recently surveyed; it is now temporarily reserved, and will be permanently reserved.

6539. It is not at present intended to construct any embankment across the neck of the Watts Valley, but simply to bring in the water as it runs?—That is all; the perennial water. We

have bought out every freeholder and every householder within the Watts catchment, even down to the point at which the dam will ultimately be made. We have bought lands we cannot possibly utilize until the reservoir is constructed, which may be twenty years hence.

6540. What traffic will then pass through that area?—Only the ordinary tourist traffic to Marysville, and a small portion of the traffic to the Acheron Valley and Buxton which will be of a light character.

6541. That road has not been proclaimed?—I am not aware. It is a Government road.

6542. In the reservation of this land, is any exemption made for roads reserved?—None whatever. It is only a temporary reservation at present.

6543. When the permanent reservation is made, if no provision is made for roads, any traffic can be stopped?—I do not think so. It is not possible to stop the traffic, or I would have done so; the Marysville people and the Narbethong people have their right to the road—it is the way to market.

6544. It would not be possible to divert any sensible portion of the drainage of the road?—No, it is so laid out that it is practically impossible. It is a matter that I really have not given serious attention to until this moment. I will think the matter over. It strikes me now it is not an impossibility.

6545. The road is laid out in a curious fashion, going up hill and down dale?—The instructions were to head all the creeks; that involves going up to the top of all the hills.

6546. If the road could be made into a contour road, there would not be much difficulty in the drainage?—That would want consideration to express an opinion upon. Just outside the watershed there is a very fine forest, known as the Victoria Forest; and now the forests in Bullarook and elsewhere are getting worked out, the millers are eager to get timber elsewhere, and are anxious to get in proximity to the railway, and now the Healesville railway is approaching completion they are anxious to get there. There are two objections to their going there; one is the effect on the rainfall that their going there might have, that is a scientific objection, and there is the other objection that they cannot get that stuff to the railway without coming across the watershed; and if one settles there another will settle, and there will be a large traffic created there, and horses and men and stores must be carried across the ranges, and the sawn timber must be brought back. The whole roadside would be a succession of camps. There is no foreseeing or foretelling the consequences of the pollution that will arise from there.

6547. Are you aware that the timber in this forest is not of a good kind for sawmill purposes, and if the traffic were diverted on the Goulburn side of the range the sawmill industry will not be materially affected; they could go elsewhere?—I think it is uncommonly good for sawmill purposes; it is excellent blue gum and messmate; it is not mountain ash down there.

6548. Would it be possible probably to divert that traffic northwards by Buxton?—I do not think the demand for timber would be sufficient in that direction. It would not be profitable to bring it to Melbourne by Buxton; that would necessitate getting it to the Alexandra railway, which is now approaching completion; but the cost would put it out of the market altogether.

6549. If the product had to be brought to Melbourne it must come down the Watts valley?—It must cross the Watts itself; and throughout the whole valley there would be no such suitable camp as at the Watts Crossing, that is where the main road crosses the river at Fernshaw. We have only been in communication with one firm of applicants, who argue there would be no camping, and they would undertake there should be no camping; but if the people did that, they can only answer for themselves.

6550. I suppose you are aware that a broad spur, many years ago, was ploughed up to a depth of about 18 inches, and there were long slides of detritus down to the valley?—The hill sides were cut in a most wonderful manner; the ground is volcanic. They work there in the depth of winter, and bring the loads down with great logs tied behind, and when the floods came all this slush was washed down into the ground, consisting of leaves and horse droppings and other things.

6551. Now the Watts valley is temporarily reserved, have splitters' licences been withdrawn?—I am not sure. It has not been given into the custody of our department yet. The Lands Department has a ranger in it who has some jurisdiction over the splitters. I do not think splitters' licences can be quite abolished, because I see palings being brought out.

6552. Is it within your knowledge that after the Fernshaw people got notice to leave splitting was actively going on?—I think there is some splitting still. I saw some very fresh palings the week before last. It will be handed over to us when we are prepared to take charge. We are not prepared to take it yet.

6553. I understood you that granting those saw millers' licences might seriously injure the public health?—So I think.

6554. What gain would the public have in exchange for that?—I do not consider there would be any gain. It would open another forest. A lot of the forest now growing would be brought down to the market for sale, that is all.

6555. It would be merely a private gain?—That is all.

6556. Do you think there is really any serious danger in a number of horse teams crossing an area like that?—I do not think there is any serious danger from the horse teams. I think there is danger from the drivers. Suppose a number of drivers are working when they ought to be in their beds; working when they have typhoid on them—suppose a young bushman is laid up with typhoid on him, laid up at the crossing of the Watts River, it is hardly possible to think what might ensue suppose the excrement from that man goes into the creek. I hardly like to think what might happen.

W. Davidson,
continued,
4th Dec. 1888.

6557. It must go into the creek?—Yes.

6558. The road keeps close to the Watts?—It crosses the Watts and a tributary of the Watts, and it is precipitous from the road always down to the Watts. Anything of an objectionable character on the hillside must go into the Watts.

6559. And with teams going along the road you are bound to have a number of dogs?—Yes, you cannot help that. I have taken action in this matter entirely on my own judgment. I would not set my opinion in the face of scientific opinion in the matter, but I think it would be bad.

6560. How do you propose to protect the timber on this Goulburn water-shed?—It would be permanently reserved for water supply purposes; it would be then, to some extent, vested in the Water Supply Department, and there would be no possibility of any one going in for the timber. I would secure all the sawmill timber.

6561. Has application been made by your department for reservation of the Victoria Forest on the Goulburn side?—No, I have not done that yet.

6562. Would it not be desirable to do that?—Yes, I think it will be done.

6563. Would not the reservation of that land tend to preserve the water on the other side of the range?—I think it would serve to maintain the permanency of the creeks. I do not know if it will make more rainfall in a year than if the trees were gone, but it will conserve the water.

6564. Is it not a fact that after the clearing of so much large timber on Mount Disappointment there was a very considerable decrease in the registered rainfall of the Yan Yean?—I am not aware of that. If there was a decrease, I think I have heard it was in common with the general decrease; but there was no doubt whatever, from the early gaugings of the Department, that the cutting of the timber on the southern slopes caused a diminution in the volume of the streams.

6565. For many years before the Yan Yean was made, there were some observations made at Yan Yean which were compared with observations in Melbourne, and year after year the rainfall at Yan Yean was wonderfully greater than in Melbourne, but in late years after the cutting of timber at Mount Disappointment the rainfall in Yan Yean was the same as in Melbourne, and in some cases less than in Melbourne; and the same at Macedon?—My recollection of those rainfall records are not quite in accord with what you say. I think we usually have about four inches more rainfall in a year at Yan Yean than in town. Again, I do not think that the Yan Yean records are affected at all by the timber-cutting in the Plenty Ranges, because the Yan Yean is only 700 feet above the sea. The ranges get up 2,700 feet, and are twelve miles beyond. We have never had a rain gauge until recently in the ranges, and since we have constructed the Wallaby Creek works we have a rain gauge there, and we get nearly double what we get at Yan Yean.

6566. Has not a great deal of young timber grown recently?—A great deal.

6567. Would not that cause the rainfall to increase?—We had no gauge before; I would like to go through all the records before answering that question.

6568. The next question is with regard to the quantity of water supplied to Melbourne, having in view the possible establishment of a system of sewage by water carriage; can you give us any information on that point?—At the present time, with a system of deep sewerage and water carriage, and only our present appliances for bringing in water, I think some of the districts would be in a very bad way for want of water. We are delivering now into the city, or did last week, an average consumption of 80 gallons per head per day, and yet, in many of the districts, as at Emerald Hill and some portions of Williamstown, and some portions of Essendon, they had not any water during the day; under a condition of that kind there could not be anything much worse; it would not be a water carriage system. Then, to have an efficient water system to Melbourne, it is essential that every pipe in the city shall be kept fully charged, under a good pressure, throughout the whole twenty-four hours. To do that, even now, without the water-carriage system, we would have to increase the mains very largely; in fact we are doing that now. Then we would want additional mains to provide not less than ten gallons a day; that, with the present population, would be 4,000,000 gallons additional a day.

6569. What sort of main would that require?—Speaking without calculation, by comparing with other mains of which I know the capacity, an 18 or 20 inch main would deliver that.

6570. In regard to the supply of water to Melbourne, do you think when the Watts water is brought in there will be an ample supply coming into Melbourne?—Yes, I think there is no question about that, when we get the Watts finished, even in its half developed state.

6571. Prior to the formation of the embankment and reservoir?—Yes, we will have water in sufficient quantities for a population of 750,000 people, including that required for the sewage system.

6572. At what rate per head?—We will be able to deliver then, I reckon, 75 gallons per head per day.

6573. That is very considerably larger than what they estimate in Great Britain?—Yes; I think the finest water supply in Britain is Glasgow; that is supposed to be 50 gallons per head. But it is nothing like it in London; the New River is the best; they give about 24 gallons. Liverpool is about 18, and Manchester 22 gallons. All those places are duplicating their works. Liverpool is spending about £3,000,000, so is Manchester, to bring the water from the lakes in Cumberland.

6574. It is considered at home that 50 gallons is the maximum?—Yes.

6575. Do you attribute the difference of quantity here to the difference in climate or unnecessary waste?—I do not think there is a great deal of unnecessary waste. I do not think there is much water put to a bad purpose in Melbourne; the conditions are different. More water is required because of the climate; people bathe here more than at home; and another thing is, Melbourne is built differently to any town at home, in that the whole of the settlement is on

allotments with gardens. I think the fact that Melbourne is a city of gardens accounts for the big consumption of water; and it is quite clear to me we are getting into trouble because it has been such a dry winter and spring; we have to keep the gardens in order from the Yan Yean.

6576. You said the pressure would have to be increased if so much water is required; could not something be done for the sewage in the way of tanks, as in the old country, to save the water?—Yes, but the tanks they use in the old country are connected with the intermittent water supply. The Melbourne supply is not designed for that system at all. I do not think the tank system, as I remember it in one town at home, could be brought into use in Melbourne at all. It would be a good thing for householders to provide themselves with tanks, and always keep them full to meet any emergency.

6577. It would be a very bad thing to introduce here—the system of having tanks in the houses connected with the sewage system?—Yes, I do not think in connexion with the water sewage system here, the tanks should be allowed in the house at all; if they were kept in the yard away from the water closets, it would be all right.

6578. You do not think tanks holding fresh water would facilitate the drainage system?—It would be a proper thing to have the tanks in connexion with the water-closet system, but not in connexion with the house. Supposing it takes 10 gallons per head per day and the household consists of ten persons, the water required for flushing would have to be delivered in the house to meet any failure in the mains. I do not think it should be part of the departmental system to put them up.

6579. Do you think it would facilitate the drainage purposes, if the water supply was rather deficient, that the tanks in connexion with water closets would assist in any way in diminishing the pressure or allowing for the diminished pressure?—The fact of having the tanks would ensure the flushing of closets when, otherwise, they would not be flushed.

6580. Would it be desirable?—I think it is an element of safety, whether it is wanted once in twelve months or not; it could not do any harm.

6581. Would it do any good?—In elevated parts I think it would, where the pressure is deficient.

6582. What are the precautions taken to keep the water pure in its passage from the Dividing Range along the clear-water channel?—We have on the upper side, in all cases, a deep drain to intercept all water from the adjacent lands, and at suitable places all the water accumulating in those drains is taken underneath the aqueduct, and taken to the Plenty.

6583. Have you simply a drain on the upper slope, or have you a system of multiple drains such as one to intercept the waters between the drain and the channel?—No, this drain is as close as can be to the edge of the cutting, and the rest is very well tended—it is like a garden all the way.

6584. You have nothing like a berm drain?—No. In connexion with the Wallaby and Jack's Creek drain, I constructed berm drains; but it was a source of trouble more than anything else. We abolished it.

6585. Have you examined the pipes that have been down any period?—Yes.

6586. Is there much fouling?—They choke up.

6587. Is it simply mud or offensive mud?—It is silt and oxide of iron.

6588. Is there much smell from the matter that is in them?—When a length of pipe is cleared out it smells very nasty indeed.

6589. Does that take place in the larger drains or the smaller pipes?—All the pipes. We have a 24-inch pipe, the original Yan Yean main from Preston into Nicholson-street. I estimate that is now of the value of a 20-inch pipe. There are two inches of incrustation throughout. I have known 12-inch pipes to be diminished to the value of a 5-inch, and 4-inch pipes choked up altogether.

6590. Are any steps taken to estimate the amount of depositable matter that comes down with the water?—The water is sometimes analysed. I think there are four to five grains of earthy matter to a gallon of Yan Yean. It has been as high as 10 grains.

6591. Could any arrangement for filtering be introduced which would reduce the amount of earthy matter?—The water could be filtered.

6592. I mean from a practical standpoint?—I think not.

6593. There is no filtration now?—No.

6594. Could anything be done in the way of flushing?—That would not aid in the prevention of incrustation; we do at times scour, as we call it, but it has no sensible effect.

6595. Why would filtration have no effect?—I say it would. I do not consider it could be carried out practically; we could make filter beds and pass the water through them at an enormous cost, but I do not see what good it would do.

6596. Would the cost be much greater here than elsewhere?—No; the works being constructed, it would not be a much greater cost to keep them up and pass the water through.

6597. You would want a large area?—An enormous area. I have some notes on the matter I prepared some years ago I can submit to the Commission, if they like.

6598. To what do you chiefly attribute the occasional offensiveness of the water?—It was offensive last in 1882; that was the confervae growing in the reservoir. It was not in the intake.

6599. At the time that those plants were growing, and the water was offensive, were analyses made?—Yes.

6600. Was there much ammonia and albuminoid ammonia at the time?—None could be traced. That smell was, in my opinion, caused by the decomposition of this confervae. It was not only hanging on the banks, but it was right through the reservoir. I sent a diver down and got some from the bottom, and it was there; it gave off gases when decomposing, and that caused

W. Davidson,
continued,
4th Dec. 1888.

the water to smell. It is an annual occurrence in Bombay. It occurs annually in the Gulf of Carpentaria in the hot season. In that season the intake of Yan Yean was the smallest on record. The streams on the southern side of the reservoir had failed; the little that was coming down the Plenty was so fouled by the drainage of Whittlesea that I shut it off altogether, and took advantage of the time to clean out the old aqueduct. There was no intake for three weeks; the temperature got up to a degree that allowed of the generation of this plant.

6601. Has any remedy been discovered?—There is no remedy in Bombay, except the monsoon rains and the lowering of the temperature. I think we have found the remedy in the bringing in of Silver Creek and Wallaby Creek; they are perennial creeks, and I am convinced they will keep the temperature below the point at which this plant will grow.

6602. Has any trouble been found in the multiplication of the shell-fish on the edges of the reservoir?—None whatever; we get a few mussels occasionally, but very few.

6603. Is it the regular practice to have periodical analyses made for the department?—No. We do not have them made systematically at all. As long as I have been in the department—sixteen years—we have only had it when some question as to the condition of the water has been raised.

6604. When was the last occasion?—I do not think we have had one made for two years; it is quite that.

6605. You know, in a good many places, they analyse the water every day?—I am not aware it is done so frequently as that.

6606. It is done in London, Calcutta, and Berlin, and other places; do you think it advisable that this check on the quality of the water should be taken advantage of here?—I do not think it is very necessary. We know exactly what goes into the reservoir. The water supply in London is taken at a point where there is the drainage of about 1,000,000 people passing; whereas, except those two houses I mentioned, there cannot be anything in the way of pollution get into the Yan Yean at all. I fancy an analysis would be very much at the end of one year as at the end of another. At the same time, I think it would be a good thing to have an analysis every six months.

6607. Do you think the fluctuations of the water depending upon rainfall and vegetable matter from week to week throughout the year should be watched?—When we had this vegetable pollution in its worst form the analysis could not detect it.

6608. Such analysis was simply the ordinary chemical analysis?—It was called a quantitative analysis.

6609. There was no biological analysis?—No. Mr. Cosmo Newbery was the analyst.

6610. Have you had an absolute analysis made of the water recently?—No. I have read of an analysis that was made in London, including all the salts; but that would not apply to the water of the present day. We have had fresh supplies.

6611. What is the area at present used as a gathering ground for Yan Yean?—The reservoir is within a catchment area of 45,000 acres; that is, what would drain into it naturally. Then the Plenty watershed we have reduced, so that we only get 9,000 acres. We have not given up control of it yet; but we have abandoned about 30,000 acres. Then on the Wallaby and Silver Creek watersheds they come to 30,000 acres. I think it would be altogether from 43,000 to 45,000 acres.

6612. Then the gathering ground is not more than before you had the Silver Creek and Wallaby?—No.

6613. When the Watts supply is brought in, what area will be brought in?—60,000 acres will be a permanent reservation; that includes the Graceburn and the Badger. We have a further reservation at the head of the Yarra, for future uses, 136,000 acres; all the head waters, from Reefton right up.

6614. Is that beginning above Reefton?—It begins at Reefton bridge. I think there is one house there.

6615. The valley of the Yarra gets very narrow from there up to Baw Baw?—Yes.

6616. Has any recent survey been made at the head waters up to Baw Baw?—A good deal of exploration has been done; the map is in great detail. We have not had any surveys made.

6617. Were not the best surveys of that locality made before the separation of this colony from New South Wales?—Yes, I have heard something of that; so far as we have come across them they are very good.

6618. With regard to the aqueduct which will bring the Watts River water into the Melbourne supply, are like precautions being taken for the permanence of the purity of the water flowing into it?—Just the same. We will not have any side drainage at all on the aqueduct on any account; in some cases it will pass over the aqueduct, and sometimes under it.

6619. What sort of rock do you pass through in the tunnelling?—In the Healesville district it is porphyry; in the Christmas Hills, it is a metamorphic slate, full of water; we will have to line that tunnel. We are getting 80,000 gallons a day of water from it that kills every kind of vegetation on the surface. We will have to line that.

6620. How will you line it?—I think we will have to have concrete.

6621. I noticed in the Bondi tunnel, where there is concrete, there are stalactites on the wall?—Wherever there is concrete they will form.

6622. Is the cutting up of this land at Yan Yean going on at present?—The owners tell us it is; I have seen a great number of pegs there; it is in allotments of an acre and so on. The proprietors have not sent us a plan yet, but they have told us they will have a sale in January.

6623. Why should they send you plans?—Patriotism, I suppose. They have told us they will give us the first chance to buy.

6624. From your intimate knowledge of the quality of the water, do you think it is right and safe for the inhabitants of Melbourne to drink it without any precautions such as filtering?—Yes, I prefer it that way; I never filter it, and I drink a good deal of it; I think filtering makes it flat.

6625. Have you noticed a long worm in the Yan Yean—two or three feet long sometimes?—No, I have not.

6626. Mr. Bowen had one exhibited in his shop that came down the Yan Yean?—I never saw one.

6627. You are of opinion that the Yan Yean water, as delivered to the houses in Melbourne, is fit for drinking purposes?—Yes, I think any water that does not contain germs is fit for drinking purposes without filtration. The only thing filtration removes out of it is the mud.

6628. Is there any proof that Yean Yean water is free from micro-organisms?—Only the analyses from time to time.

6629. Are you aware that this worm, or a somewhat similar worm in fresh water, acts something like the Guinea worm—it goes into the flesh?—No.

6630. With regard to the possibility of animal pollution of the water, is there no chance of the water being contaminated in its progress through Melbourne itself—granted that it is absolutely pure when it is brought to Melbourne, is it certain it is pure when delivered to houses?—I think so—I do not see how pollution could get into the pipes.

6631. By those hydrants in the streets?—There might be a chance of that if the main gets empty and the balls fall. At one time we know the pipes were frequently filled from the street sewage—the pipes were so situated that on the falling of the water the sewage water ran in; but this has been altered; the position of the plugs has been altered so as to bring them on to the foot-path, and at the refilling of the mains the water is allowed to blow off for a considerable time, so that everything that may have got in may be allowed to flow off—in fact every main is charged twice.

6632. In view of the possibility of such contamination affecting the water, is it not desirable there should be a check upon the quality of the water, say once a month, or whenever it might be considered desirable?—You refer to water taken from the main. I will not say it would not be desirable, but I do not think there would be much gained by it.

6633. Not in view of the fact that this is a town characterised by the presence of typhoid fever, which is known to be connected with the water supply?—I do not think so.

6634. Have all the plugs been altered?—So far as we know; of recent years my men have dropped across a few that have been overlooked. The plugs are not in our custody—we only put in plugs and alter them when directed to do so by the local governing bodies. Recently we found some that had not been altered, and we drew the attention of the governing bodies to them. I do not think there are any now.

6635. Having regard to the fact that eels sometimes get into the pipes, and are decomposed, would it be desirable to have metal screens over the mouths of the pipes?—We have screens, but I cannot account for some of the fish getting through. We get fish of greater diameter than the holes in the screens sometimes; we frequently get eels that will choke up pipes two inches in diameter.

6636. Do you desire to make any further statement?—I cannot think of anything just now. If I think of anything I will jot it down.

The witness withdrawn.

John Buchan sworn and examined.

6637. *By the Commission.*—You have expressed a desire to give evidence before this Commission?—Yes.

John Buchan,
4th Dec. 1888.

6638. What is the special matter on which you desire to give evidence?—With regard to the soap-boiling and tallow-rendering factory at the bottom of Victoria-street, on the banks of the River Yarra.

6639. Will you make, as briefly as possible, such statement as you think fit?—The residents of Studley Park and Hawthorn have been troubled, for a number of years, by the nuisance arising from the work carried on by a gentleman, Henry Walker, a justice of the peace, and formerly mayor of the city of Collingwood. The nuisance that affects me most, individually, is from the chimney stack; when the wind is from the south-west the fumes from it are most disgusting.

6640. Is the nuisance continuous, within your own knowledge, provided the wind is in the proper quarter?—It is intermittent; it does not last for more than two or three hours at a time; sometimes for a very much shorter period.

6641. Are you able to say how that nuisance is caused?—I think it is caused by the rendering of putrefied fat and meat; I know the perfume from it is very offensive, and it has a tendency to make one very sick.

6642. Is it within your knowledge that the odour pervades a district of considerable size?—I do not think it goes more than about a quarter of a mile; it affects all the houses within the range of the smoke from the chimney.

6643. How long, within your knowledge, has this nuisance been in existence?—Fifteen years, to my knowledge.

6644. Have you any evidence to show that this nuisance has caused any injury to health?—Only from hearsay. It has not caused any injury to the health of myself or my family.

John Buchan,
continued,
4th Dec. 1883.

6645. But it has caused very great annoyance?—Very great; we have had to close the house up on several occasions, and then it seems to get through under the doors and windows. In fact, it is unbearable for a time.

6646. What steps have you taken to secure a mitigation of the nuisance?—Periodically I have sent reports to the Central Board of Health and the local board of health, but we have never had any redress. About the beginning of February of this year, I wrote to the Central Board of Health.

6647. Your first application for redress ought to be to the local board?—We have exhausted the local board.

6648. Will you state definitely what you have done with the local board?—We have sent in petitions, and made all sorts of efforts to have the nuisance abated. In the beginning of February of last year, I wrote to the Central Board of Health, and they referred us to the 6th clause of the Act, to the effect that we had to apply to the local board. Before this date—we wrote to the local board of health, Collingwood, and this is the reply I had, dated 9th February, and addressed to myself—[*handing in the following letter, marked A*]:—

“SIR,

“City of Collingwood,
Town Clerk’s Office, 9th February, 1887.

In continuation of mine of the 27th January, I have now the honour to inform you that the Sanitary Committee, to whom the matter was referred, after having carefully inspected the factory of Mr. H. Walker, Victoria-street, report that they found the premises and surroundings very clean, and free from any offensive matter likely to cause the nuisance said to arise from these works.

I have the honour to be, Sir,
Your most obedient servant,

J. Buchan, Esq.,
Finhaven, Stevenson-street, Kew.

A. M. MORTLEY, Town Clerk.”

I also wrote to the Borough of Kew on the 20th January, and their reply is as follows—[*marked B*]:—

“SIR,

“Borough of Kew,
Town Clerk’s Office, 20th January, 1887.

I have the honour, by direction of the local board of health, to acknowledge receipt of your letters complaining of the nuisance from Walkers’ candle factory, and to inform you that the matter has been referred to the local board of Collingwood, within whose jurisdiction the nuisance exists.

The local board of health are of opinion that the Central Board of Health are more likely to take effective action in the matter, as the nuisance does not affect any one in Collingwood, and recommend you to bring the facts before the Central Board.

I have the honour to be, Sir,
Your most obedient servant,

J. Buchan, Esq., Stevenson-street, Kew.

HOLLAND LOXTON,
Secretary to Local Board of Health.”

Then there is a letter to another gentleman who has taken action in the matter, from the Central Board of Health—[*marked C*]:—

“No. 87/710.
SIR,

“Public Health Department, Offices of the Central Board,
Melbourne, 14th February, 1887.

I have the honour to acknowledge the receipt of your letter of the 10th instant, and to inform you that the course to be taken has been indicated in the Board’s previous letters of the 6th and 13th days of last month, on this subject, addressed to Mr. John Buchan, copies of which you can see at this office if you will be good enough to call, and supposing it may not be convenient for you to communicate with Mr. Buchan.

I have the honour to be, Sir,
Your most obedient servant,
J. W. COLVILLE, Secretary.”

G. N. Arnall, Esq., Studley Park.

I do not know where the letter is that that letter refers to. Then on the 4th March there was a meeting of the residents of Studley Park and Lower Hawthorn, held at the offices of Messrs. Danby and Gilmour, when the following resolutions were carried unanimously:—“That proceedings be taken against Mr. Walker at common law, provided a sum of at least £200 be collected or guaranteed. That a sub-committee, consisting of Messrs. Greenlaw, McGregor, Sprigg and Buchan, be appointed to give effect to the foregoing resolution.”—[*The paper was marked D*]. A number of gentlemen subscribed the money to proceed against Mr. Walker, and the sub-committee, of which I was a member, took the opinion of Dr. Madden and Mr. Mitchell as to the course to be pursued. I will put in Mr. Mitchell’s opinion—[*handing in the same, which was marked E*]. In that we have a remedy, but there is a doubt expressed with regard to the time that this place has been in operation:—“I assume that Walker has not been carrying on his trade and creating the nuisance now complained of for more than twenty years—if he has, other and difficult points of law might arise in the action I have suggested, unless, indeed, it can be clearly shown that the stinks have been much more intolerable and offensive in the last few years. Apart from the legal action above suggested, this is a point that should be carefully considered in getting up the evidence for a judge or jury.” A consultation was held after that, and it was then decided, on the opinions of Dr. Madden and Mr. Mitchell, that proceedings could only be taken by the board of health, and there we failed.

6649. As Mr. Walker had been carrying on this business for more than twenty years, it was held by the committee it was no good to proceed except through the board of health?—Yes, and we are stranded.

6650. Did you tell the board that?—We applied to our own board, and they said they would proceed if we would pay the expenses. We said we would, but they have never proceeded; we can get no redress at all. I do not want to say anything against Mr. Walker; I believe him to be a thoroughly upright man; he is well thought of by the people there, and they always return him to the municipal council; but, somehow, we do not seem to get redress.

6651. Is he a member of the municipal council?—I do not know if he is now; he was mayor of Collingwood last year.

6652. That municipal council is the local board of health?—Yes, and he was a member when we moved in the matter some ten years ago. If there is any doubt at all as to the offensiveness of the thing, you can get any number of people to come forward and give evidence. It is really a great nuisance to people who have to go by the tram. One gentleman, Mr. McNeil, attended the meeting on the 4th of March, and told the meeting (it is his statement, not mine, but I give it for what it is worth) that a day or two before, when his wife was sitting down to lunch in the middle of the day, the window was open, when the wind changed, a blast from the factory entered the house, which caused her to go away, and she and her servant were sick and vomited.

6653. Is there any other matter you desire to bring before the Commission?—This is a matter that materially affects us.

6654. Will you explain how it was that the course suggested by the secretary of the Central Board of Health was never taken; he wrote plainly setting out what had to be done, and the course he suggested was never taken?—We felt the central board would not assist us.

6655. Were you not told clearly if the course pointed out in the Act were taken, and the complaint properly made was not attended to, the Central Board would take steps, and no answer was sent to the secretary of the Board?—We wrote to the local board.

6656. Are you aware that no communication was ever sent to the Central Board that this action had been taken?—I cannot say; we intended to proceed at common law, but when we found our remedy at common law was gone, it is a difficult thing to get people to go on agitating.

6657. The secretary told you what course to follow in order to put the Board in a position to take steps; that course was never followed?—I think it was.

6658. Then no notice was sent to the secretary of the Central Board that it had been. Instead of following the course pointed out by the Act, the complaints were sent in; and the suggestions given were never attended to?—We now bring it under your notice that the nuisance does exist, and has existed; and we feel we are powerless.

6659. The point is this, that, if formal complaint were made to the local board, and the local board did not do its duty, and notice were given to the Central Board, the Central Board would then be in a position to take certain steps; why has not that been done?—We wrote to the local board, and they said there was no nuisance.

6660. Then the persons complaining should have been prepared with evidence that the nuisance did exist. If a notice sent to the local board is disregarded, the Central Board is prepared to take steps, if it is informed; but you never did it?—There is another nuisance. The Tramway Trust have made a new drain, which empties the drainage from the street into the river by the ferry.

6661. All the Commission can take action in, is in cases where the law is deficient—where neither the local board, nor the Central Board can act properly to quell a nuisance; but in this case the Central Board could act?—I have consulted several people, and they seem to think we should bring it under the notice of the Sanitary Commission. We do not ask for redress; but we bring it before you, so that you may notice in your report that there is a nuisance in that place.

6662. Is there any other matter you would like to speak of?—There is the Collingwood tip. The street sweepings are dropped in a clay hole on the banks of the river; and when we have rain, the matter is washed into the Yarra, quite close to the ferry. Sometimes the nuisance is very great, when the wind is in a certain direction. What I am complaining about is, that we feel it is an injustice to the ladies and children who live in the district. The Collingwood Council chose a place opposite the ferry to deposit the sweepings, and the Tramway Trust have put a drain down there, that not only drains the tram lines, but the Collingwood and Richmond councils have tapped that sewer, to let their drainage in, so we have not only the refuse from the houses, and so on, but the house drainage is discharged into the river, at the very place where the people have to cross in the ferry.

6663. What is the situation of the clay hole where the street sweepings are put in?—Just before you get to the ferry boat on the East Collingwood side.

6664. Where does the drain come into the river?—Underneath the ferry steps; it is gutter matter and the municipal drainage; it goes into the river under the steps of the ferry.

6665. Can you smell it?—When the river is low. In order to check it, they had a cap put on and let into the river; and it is only when the river is low that we smell it.

6666. Who gave the councils leave to tap the tram drain?—I do not know; the tram people I suppose. In reference to that matter of Mr. Walker's factory, I find that we sent a certificate signed by ten residents of the district to the local board of health as required by the act but up to the present they have not taken proceedings.

6667. If that was not attended to, why did you not inform the Central Board?—The Central Board was informed; we sent them a copy of the petition we sent in.

The witness handed in the following paper—[*marked F*]:—

"SIR,
I have the honour, by direction of the local board of health, to acknowledge receipt of your letter of the 3rd instant, forwarding certificate by way of notice, and requesting the board to take action against Mr. Henry Walker; and in reply thereto am instructed to inform you that, on getting a guarantee to pay all expenses, and on the parties to the certificate stating their willingness to come forward and prove the case, the local board will take the proceedings required.

I have the honour to be, Sir,
Your most obedient servant,
HOLLAND LOXTON,
Town Clerk and Secretary to Local Board of Health."

The witness withdrawn.

Adjourned.

TUESDAY, 26TH FEBRUARY, 1889.

Present :

Professor H. B. ALLEN, in the Chair;

C. Hodgkinson, Esq., C.E.,

T. M. Girdlestone, Esq., F.R.C.S.,

A. P. Akehurst, Esq.,

W. McCrea, Esq., M.B.,

Professor D. Orme Masson.

Thomas B. Muntz sworn and examined.

T. B. Muntz,
26th Feb. 1889.6668. *By the Commission.*—What is the nature of your office?—Shire engineer.

6669. In the shire of Boroondara?—Yes.

6670. Will you state whether you, or to your knowledge the clerk of Boroondara received a copy of the questions which were sent out by this Commission on the 25th of May last?—Yes, the clerk did.

6671. Did you notice that they were addressed on the 23rd, and they were posted on the 25th, of May last?—Yes, I understood so, and that they were sent back by the clerk; so he instructed me.

6672. Can you give any explanation why the information asked for was not forwarded to this Commission?—I understood it was forwarded. The clerk told me to-day that it had been forwarded.

6673. You mean that it has been forwarded within the last few days; since you have been subpoenaed?—No, about the time it was sent to the clerk.

6674. Was any subsequent letter, within your knowledge, addressed to the officers of the shire asking again for such information?—I am not aware.

6675. Was a copy kept of the answers sent on behalf of the shire?—I believe not.

6676. Have you now with you a schedule of replies to the questions submitted by this Commission?—Yes.

6677. Will you then place it before the Commission for its assistance in its inquiries?—Certainly—[*handing in the same*].

6678. Can you state what length of streets there is altogether in the district?—I think the answer is there.

6679. No. The question was in No. 3—"What length of streets in the district is (a) paved, (b) unpaved, (c) channeled, (d) unchanneled?" And the answer is given to the first and third of these subdivisions. It is stated that the length of the paved streets in Boroondara is about a mile, and of the channeled streets about five miles, but there is no answer as to the length of streets unpaved or unchanneled?—There are about 16, or perhaps 18 or 20 miles of main roads metalled, and there are a great number of private streets recently laid out, on many of which there are no houses at all erected. It would be impossible to answer more accurately than that.

6680. In reply to question five, you state that the general method of laying down the channels is by dressed and rough pitchers. How are those joined together?—Merely with sand; sand joints only. I may add that I have advised the council to have the joints cemented or tarred, but nothing has yet been done in that way.

6681. In question eight, it is inquired whether the channels are periodically flushed; if so, at what intervals of time. Does the reply given mean there is any flushing?—No. We have the Yan Yean laid on to only very few streets in the shire.

6682. In question 15, it is asked—"What is done with the refuse from back yards, and where is it deposited now?" would you explain what the answer to that question means—[*reading the same*]?—That is written by the secretary. What he means is that there is only a very small township at Boroondara—that is Camberwell, which has an area of about 50 acres settled, and from this portion of the shire the refuse is carted to the outlying farms in the shire. In the other parts of the district the refuse is simply buried in the gardens or farms.

6683. The next question is, "In what manner is the night-soil collected? the reply is "By nightmen." Does that mean the ordinary night-carts?—Yes; the ordinary night-carts.

6684. There is another question of "What is done with the night-soil?" the reply is, "Carted away?"—We do not know at all. There is none of it used in the shire. As far as the council knows there are no farms in the shire that take in the night-soil. We do not know where the nightmen cart it to. It is further out.

6685. Is not it a part of the duty of a shire to know what becomes of the night soil on its own territory?—Yes, I think so; a very important part of their duty as Local Board of Health.

6686. Does not a large quantity of it go out towards Burwood, on that road?—Of course I am not living there, I am only occasionally there; but I understood from the secretary that there was no depôt in the shire where the night-soil was deposited. I was particular about that, because I thought there was one out at Burwood.

6687. In Boroondara, the land "boom" has destroyed all the farms that used to use the night-soil?—Yes, nearly all.

6688. I gather from the answers that the sanitary inspector receives £25 per annum, and that he combines with this office those of rate inspector, collector of statistics, and registrar of dogs?—Yes.

6689. The health officer of the district receives £20 per annum. I notice also as to question 25, "What is the annual mortality per 1,000 inhabitants from zymotic diseases in the district for the past five years?" the answer is, "Not aware, see Registrar of Deaths"?—The shire, I may

say (that is the Local Board of Health) have only commenced to perform those functions, and I do not think they have any record at present on those sanitary points.

T. B. Muntz,
continued,
26th Feb. 1889.

6690. How long has the shire been constituted?—Thirty years.

6691. How long has there been a health officer in the shire?—I cannot say. Certainly four or five years, at all events.

6692. Could a reply to this question have been obtained then by the health officer?—I suppose a report is given annually? I do not know, indeed.

6693. Have any by-laws, regulations, or orders been issued by your council?—Yes, I have brought them with me—[*handing in the same*].

The witness withdrew.

Newton Edward Jennings sworn and examined.

6694. *By the Commission.*—What is the nature of your office?—Shire secretary and engineer, in the shire of Heidelberg.

N. E. Jennings,
26th Feb. 1889.

6695. Did your office receive a copy of this schedule of questions which was sent round by this Commission in May last?—I saw a copy of it among the records of the office. I have only been there the last six or seven weeks myself.

6696. Can you give any information as to why no information was forthcoming from the office?—No, I imagined it had been sent. I looked to see if there was any copy of replies to it, and did not find any.

6697. Are you prepared to put in answers to those various questions at present?—No, certainly not to all of them. I have not been in office long enough to know, and have not had time enough to make sufficient inquiries.

6698. Are you prepared to answer any large proportion of them at present?—Not a great many of them. I thought the report had been sent in, as I saw a copy of the questions in the office.

6699. As a matter of fact, the shire has not thought it fit even to acknowledge the receipt of the queries—you are the secretary of the shire?—Yes. I hold both offices.

6700. Is there any officer who could give information?—I do not know whether my predecessor would be able.

6701. By what time would you be able to get answers to those questions?—I can make inquiries and find out. We have no proper office at present, and it is a very difficult matter to get any information. It takes a very long time to look through all the papers.

6702. Will you be good enough, as soon as you can, to answer such as you can from your own information, and to make inquiry as to what other sources of information there are, and let us have as much as you can, at your leisure?—Certainly.

The witness withdrew.

Alfred Clayton sworn and examined.

6703. *By the Commission.*—What is your office?—Engineer to the town of Hawthorn.

Alfred Clayton,
26th Feb. 1889.

6704. Can you state whether a copy of this schedule of questions was received by the office of that town?—It was.

6705. Have you any explanation to give why the proper answers were not remitted for the use of this Commission?—The town clerk is away on six months' leave. I recollect filling up all the answers referring to my department.

6706. Then your explanation is—that owing to the illness of the town clerk the answers were not sent?—I cannot find a record in the office of what is filled up, so I cannot understand about that.

6707. Are you prepared with answers to those questions now?—Yes, I have filled them in, and the acting town clerk has filled in the remainder. I have also prepared a general plan of the town showing the course of the main drain, showing the part already completed and the part in progress, and the part still remaining undone—[*explaining the same*].

The witness withdrew.

Richard Burnell sworn and examined.

6708. *By the Commission.*—What is the nature of your office?—I am Town clerk of Brunswick.

Richard Burnell,
26th Feb. 1889.

6709. Did you receive a copy of those questions circulated among the municipal bodies by the Sanitary Commission in May last?—Yes.

6710. Why did not you give the answers within reasonable time?—I was unable to get the information required, more particularly that portion relating to zymotic diseases.

6711. Did it take, reasonably, from May till February to obtain answers to those questions?—It was postponed from one time to another.

6712. I see the refuse from the streets is deposited in the quarry-holes?—Yes.

6713. Is that an unvarying practice?—Yes.

6714. The refuse from back yards is dealt with in the same manner, and at the time of deposit it is well covered over with earth. Have you any regulation as to the amount of earth to be so placed?—No; but as to the quantity, we have a by-law to insist that it shall be covered with a sufficient quantity to prevent the escape of noxious effluvia—[*handing in a copy of the by-law*].

6715. Are those quarry holes inspected from time to time?—Yes, by the sanitary inspector and the health officer.

Richard Burnell,
continued,
26th Feb. 1889.

6716. Are complaints made about their condition?—I have only heard of one complaint during the last six months.

6717. Do you know what is done with the night-soil from your district?—It is carted into the farming districts; Preston, I understand, at the present time, but I am not positive as to that point; but I know from inquiries I have made that it is carted from Brunswick.

6718. Have you any control whatever over the destination of the night-soil?—That it shall not be buried in the district in places other than those approved of by the Board of Health.

6719. Do I understand that the three sanitary inspectors there act as rate collectors and valuers?—Yes, each one.

6720. I see that the drainage leads on the east side to Merri Creek, on the west to Moonee Ponds. Are the main channels to these creeks made or in their natural state?—All the main drains in the town are paved, or bricked, or cemented, except a portion of the drain in the north ward conveying drainage into the Moonee Ponds, which is in a state of nature.

6721. On both sides?—Yes, on both sides; that is, with the exception of the drain that runs through the Royal Park. I had forgotten that; that discharges into the Moonee Ponds on the west side, and is not bricked or cemented.

6722. Into a large gully?—Into the Moonee Ponds. Our portion of it is thoroughly completed.

6723. That is, you have made the sewer to open into the gully that runs through the Royal Park, and that leads ultimately into the Moonee Ponds Creek?—Yes.

6724. Have you any other by-laws and regulations?—We have other by-laws under the Local Government Act, but not building regulations. These are all we have under the Health Act. Building regulations are in process of completion now.

The witness withdrew.

Frederick George Miles sworn and examined.

F. G. Miles,
26th Feb. 1889.

6725. *By the Commission.*—What is your office?—Town Clerk of the city of South Melbourne.

6726. Did you receive a copy of those questions that were circulated by this Commission in May last?—Yes.

6727. May I ask why a reply was not forwarded to those questions?—Why a reply was not forwarded to the Commission was on account of pressure of business which has been exceedingly heavy in my office since the time of the change that took place in the matter of assistance that I had in the office.

6728. Are you able now to supply answers to those questions?—I think so. I have prepared this document which I will hand in—[*handing in the same*].

6729. I see that the drainage passes partly to the river Yarra, partly to the Port Melbourne lagoon, and partly to the sea; can you give an idea of the proportions passing into each of those; can you say how much passes into the lagoon?—There is probably about a fourth.

6730. And how much to the river?—One-fifth, and the remainder goes to the sea—I should think about that proportion.

6731. Has there been recently a drain cut to the sea?—Yes, the Macgregor-street drain.

6732. That has diverted a good deal of water from the lagoon?—Probably that has taken some.

6733. I see the refuse from the streets is taken to tips and covered over?—Yes.

6734. Can you specify the locality of those tips?—I can tell you at present where it is; a street known as Dodd-street, at the back of the Military Barracks and the Homœopathic Hospital, before that it was in Woodgate-street, and before that in two reserves in Park-street.

6735. In your opinion, is the condition of that tip in Dodd-street satisfactory?—It is not desirable at all to have it.

6736. Has that constituted a great nuisance in recent times, in your opinion?—I do not know that it has in recent times.

6737. Have complaints been made?—Complaints have been made.

6738. What does your council propose to do to mitigate the trouble and end the complaint?—I addressed a letter to the Central Board of Health in the early part of this month on the matter. Some twelve months ago, the council of the city of South Melbourne invited a conference of the councils as to the erection of destructors, that matter has been going on ever since. It was proposed that the Government should render assistance by giving a site, on which the first destructor could be built, as it would be the first in the colony. However, no assistance was obtained from the Government, and we found great difficulty in arranging with other municipalities in consequence of the difficulty of selecting a site. The matter was then taken in hand by my council, and in floating their new loan of £128,700, which is just now being negotiated, it was proposed then to appropriate a sum of money out of the loan for the purpose of erecting a destructor, which would cost about £5,000; however, it was found that that money could not be appropriated under the Local Government Act for such purposes—that is, from loan moneys, and £5,000 is rather a large amount to take out of any one year's rates, so the council in preparing the estimate for the year put down £2,500 as half the cost, and the following year they propose to appropriate £2,500 more, so that the work may progress during this year and a part of the cost be defrayed out of this year's revenue and the balance out of next year's.

6739. In reply to the question—"Where has the refuse of the backyards been deposited for the last ten years," the answer is—"In reserves and streets." I gather from that that the streets have been levelled up with the refuse of backyards?—Yes, they have.

6740. Have any private lands been levelled in the same way from the refuse in back yards?

—Not from the refuse from South Melbourne.

6741. Have they been levelled in your district from refuse brought from other places?

Yes. I refer to that in reply to one of the later questions, as to the duties of the inspector.

6742. I am speaking just of yard refuse, not of night-soil?—No, street sweepings and yard refuse.

6743. Have you had to take steps to prevent such being brought into your territory?—Yes.

We had a third man employed to detect those persons who were without any authority depositing rubbish of this sort from Melbourne. The great difficulty we had was in preventing the offensive stuff coming from other municipalities and being deposited in South Melbourne on private lands.

6744. Have houses been erected on land levelled up in that way?—Not to my knowledge.

There was a reserve in Henderson-street that was being filled up in that way, but the reserve was set apart for the State school, and the work of depositing the street sweepings immediately ceased.

6745. How long had it been going on before it was stopped?—Perhaps a couple of months.

6746. Was the school put on this land?—No, the school has not been built. The reserve is fenced in and what was deposited there has been covered with good clean earth.

6747. To what depth?—Some two or three feet.

6748. I gather then that your system of taking away nightsoil means a substantial loss to the city?—Very considerable.

6749. You pay yourselves 17s. 6d. a pan and get 12s. from the ratepayers?—Yes, and the difference is paid out of the rates. For the last two or three years we pay a good deal more for the contract than before, because we were precluded from depositing it in the Fisherman's Bend. The city of South Melbourne and the borough of Port Melbourne both used to use that bend for the purpose of depositing the night-soil there.

6750. Where is it taken now?—It is taken out of the city of South Melbourne.

6751. Where is it taken to?—I understand it is taken to Brighton, and beyond Brighton; that is only from conversation.

6752. You retain no control over that?—No; the contract is that the contractor shall remove it from the city.

6753. Can you give the information we have asked for about the mortality from zymotic diseases?—No. I have endeavoured to obtain it from the health officer and registrar.

6754. Does not the health officer make a return of the deaths from zymotic diseases?—No. It is not in his returns. I will make further inquiry from him and will supply it, if it is thought desirable.

6755. As a matter of fact, the Local Board of Health is not informed as to the prevalence of zymotic disease in any exact fashion?—The health officer's report is produced once a year.

6756. Then that apparently does not give that information as to zymotic diseases in your district?—No; I think not.

6757. Does not it seem desirable to you that you should have that information as a Board of Health?—Yes.

6758. Would not the deputy-registrar give it?—I endeavoured to get it from him, but found there was a difficulty in getting it—as to looking over the books the last ten years.

6759. As to the regulations, by-laws, and orders, is that a complete set [*handing in the same*]?—This is a printed set of the by-laws up to a certain date. The others are in manuscript. I have some notices we serve for the suppression of nuisances—certain notices for paving and constructing rights-of-way and so on.

6760. This is substantially a complete set?—Yes, that is a plan which is prepared, and which we supply to every person who is called on to construct a right-of-way. We give the plan with the notice—[*handing in the same*].—I have brought that as a specimen of the plans we adopt.

The witness withdrew.

William George Swift sworn and examined.

6761. *By the Commission.*—What is your office?—Town clerk of the borough of Northcote.—[*The witness handed in the return asked for*].

6762. I see the population is about 5,100?—Yes, as near as we can arrive at it.

6763. In answering the question “as to the cost per ratepayer for scavenging and disposing of refuse,” the number 8,200 is given, what is that?—I was rather in doubt as to whether the question referred to the number of ratepayers or the number of assessments. Of course the ratepayers are not exactly that number, as some persons own, perhaps, a number of allotments. The borough of Northcote consists of a number of vacant allotments as you know. The houses are about 890 and the assessments are over 8000.

6764. How do you levy your rate—do you levy it on every house and allotment separately?—Just on the houses only, it is not compulsory—it is optional whether they employ the council's contractor, or employ anyone else.

6765. Practically it is 15s. 9d. for every house?—Yes.

6766. Do you know what is done with the night-soil from the borough?—No, I cannot say. The only contract is to take it from the borough, and I am not certain whether it is taken to Thomastown or Bundoora.

6767. Is the health officer of the borough health officer of any other district as well?—I think he is for Whittlesea also.

W. G. Swift,
continued,
Feb. 1889.

6768. The £10 per annum paid to the health officer is the salary paid by your borough?—Yes. You will notice that the death rate is only put in pencil, because I have not the accurate number. I will endeavour to supply it to the Commission within the next few days if I can manage it. It is a difficult matter to get at. The registrars do not lay themselves out to give that information, and the health officer does not give it in his report—I do not think it is accurate at present.

6769. Will you get the health officer to check this and initial the information and send it in?—Yes.

6770. As to by-laws and regulations, are there any?—We have not a number of our by-laws printed, but I can supply you with the main ones. We have had building regulations in force for the last eighteen months, and the other by-laws are only in manuscript. I will forward them on to you.

The witness withdrew.

Adjourned.

D I G E S T.

MR. JAMES URIE, Mayor of Flemington and Kensington.—Has been resident in Flemington seven years. The Borough Council of Flemington and Kensington has, during the last three years, made formal protest against the retention of the City Abattoirs on their present site. The Council considers that the abattoirs are a nuisance. They are unsightly; the drainage is bad, and causes pollution of the Saltwater River with a large quantity of blood, and with other offensive matters from the associated trades. There is a strong offensive smell from the paddocks where offal is buried. The accommodation paddocks are unsuitable for stock in wet weather, when the cattle have to stand up to their bellies in mud, with a truss of hay thrown in for food, which is soon trampled under foot. The site of the abattoirs and paddocks is altogether unsuitable, being so low that proper drainage is impossible. The Borough Council also objects to the present position of the cattle-yards. The area of ground is too small for such a purpose, and the land too valuable, while the cattle are dangerous to pedestrians. He is not aware, however, that anyone has ever been killed or injured by the cattle, and there is a by-law regulating the hours during which cattle may be driven through the streets. Fines are inflicted every week for infringement of this by-law, but the butchers defy the law. The noxious trades must accompany the abattoirs, and they are an intolerable nuisance. He was not aware that there is power in the Health Act to proceed against nuisances outside the district—the Borough Council had had a communication from the Town Clerk of Melbourne to say they had no power to interfere with these noxious trades on the property of the city of Melbourne. The noxious trades within the Borough are in a fair condition. The Borough Council has power to regulate or suppress these trades. There was a foul smell from these trades; and they might be kept cleaner. The Council's inspector had several times threatened those who carried on these trades; and witness understood that improvements had been made. No other action had been taken. He thinks the health of the district would be better if the abattoirs were removed; and has heard of children being sick and vomiting from the smell from the abattoirs and boiling-down establishments; but he is not aware of any specific case in which residents in the district have suffered in health owing to the nuisances caused by the abattoirs. The general mortality of the district is not high, and zymotic diseases are not unduly prevalent. The presence of the abattoirs and cattle-yards depreciates the value of land in the district. Land is worth £45 at the lower end of the Racecourse-road, while land on the same road, but opposite the cattle-yards, is only worth £9. The Borough Council objects to the presence of the abattoirs in the district no matter how they may be conducted—even if re-constructed, with raised floors, proper drainage, and desiccators—because the site is too low, the ground is too valuable, and the noxious trades would still remain. The advantages that would ensue from removal of the abattoirs are—That the noxious trades from all parts would follow them; the meat would not be fretted, and would be delivered in better condition; land would be increased in value 100 per cent.; and the extension of the city northward would not be checked. He has not given much consideration to the question where the abattoirs should be removed to; they might go to Echuca; Keilor Plains, Bulla, and Cook's Point have been suggested as sites. He thinks the new abattoirs should be erected by the State, inspected by Government inspectors (Q. 382); when under municipal management the inspection might not be quite so stringent as when conducted by private persons, but public opinion would compel the municipal authorities to keep the abattoirs in proper order. Eight acres of the land on which the abattoirs and cattle-yards are would revert to the Government if they were removed (Q. 404). There is a good fall from the cattle-yards both towards the Saltwater River and towards the Moonee Ponds Creek. The latter drains a portion of North Melbourne as well as Flemington; the drain from the cattle-yards enters the creek at the boundary of the two municipalities, and passes through a thickly-populated district. There is a large catch-pit in the drain just before it enters the creek, and this receives drainage from the cattle-yards, and all the drainage of the borough, including the bulk of the urine, and the kitchen and bath water from the houses. There is very little fall in the Moonee Ponds drain, and the tide comes up it as far as Flemington-bridge, which is about 100 yards from where the borough drain enters. There is no stated time for emptying the catch-pit. The drainage ultimately finds its way into the Yarra (Qs. 302-318). He is not aware of any complaints having been made about the municipal drains or the catch-pit—the latter is on Government land (Qs. 392-4).

Protests by Council against abattoirs, 252.
Reasons why the abattoirs should be removed, 252.
Polluting river, 252.

Burying of offal, 252.
Accommodation paddocks, 252.
Cattle in mud in paddocks, 252 and 255.
Site too low, 257 and 262-266.
Also object to cattle yards, 259.

Danger from cattle on streets, 259 and 357-365.

Noxious trades on Saltwater River a nuisance, 259 and 324-330.

Powers of Local Boards as to nuisances, 328-334-344.

Condition of noxious trades within borough, 261 and 339.
350.
346 and 350.
Health of district, 261 and 321-323.

Abattoirs depreciate the value of property, 261.

Object to abattoirs even if improved, 352-356

Advantages of removing the abattoirs, 261.

Where new abattoirs should be erected, 375-379.

Control and inspection of abattoirs, 387 and 393.

Drainage of cattle-yards and of district, 297-318.

411-428.

Objections to present abattoirs.

Site low, drainage, pollution of river, 418.

Burial of blood and offal, 419-426.

Buildings too small, 428.

Accommodation paddocks, 490-497.

Cattle not fed, 499-501.

Time cattle remain in paddocks, 540.

Condition of noxious trades on river, 429-444.

Inspection of noxious trades, 526.

Powers of local boards in regard to nuisances, 530.

Council does not wish to have abattoirs improved, 530-535.

Health of district, 532.

Utilization of site, 514-523.

Cattle traffic in streets, 486-488.

Drainage of cattle-yards, 448-468.

Silt pit, 459-467.

Drainage of west part of cattle-yards, 474.

Condition of river banks, 479-481 and 484, 485.

Moonee Ponds canal, 469-472.

Effects of abattoirs and noxious trades on health, 596-600.

Offence from boiling-down establishments, 593 and 602.

Powers as health officer, 603-620.

Effects of mode of burying offal, 560 and 589.

Atmosphere of abattoirs saturated with septic germs, 627.

Construction of abattoirs, 556.

Drainage, 561 and 562. 584 and 585.

Floods, 623, 624.

Mr. WILLIAM CATTANACH, Town Clerk of Flemington and Kensington.—Has been Town Clerk of Flemington and Kensington for twenty-two months, but he does not reside in the borough. The site of the City Abattoirs is too low, and the drainage imperfect. A large amount of highly blood-stained fluid runs into the Saltwater River, while offal and blood are buried in trenches 18 inches to 2 feet deep, dug in a wet clayey soil, and then covered with 6 to 9 inches of soil; at times the tide comes over the ground where this burying takes place. He did not see any lime or disinfectant used during the burying process. The buildings are too small and cramped, lacking fresh air. The accommodation paddocks are bad. There is no shelter, and the cattle are often knee-deep in mud in wet weather; they are not properly fed, and have not a proper supply of water. The cattle are not crowded in the paddocks, but there is not sufficient proper accommodation for cattle coming down from Riverina. They arrive on Tuesday, are sold on Wednesday, and may be killed on Thursday; they have no time to pick up condition, and the meat is fretted in consequence. The noxious trades on the Saltwater River are a nuisance, and the nuisance is inherent in the trade, the trades in question being as well conducted as they can be. The local inspector had not reported that refuse was allowed to lie about on the floors of these places in an offensive condition. He was aware that a quantity of offensive fluid passed into the river from these trades, and that the buildings were old, and he had threatened to prosecute one of the occupiers if certain defects were not remedied; the defects were remedied in consequence. The noxious trades within the borough are inspected by a local inspector, who, until three months ago, was paid by commission; now he has a fixed salary, and he is to inspect the noxious trades once a month, and report every month to the council. The municipality has power to prosecute in regard to nuisances which affect householders in the municipality, although the nuisance is not situated on lands under the control of the municipality. The abattoirs are a nuisance, but the Borough Council has not taken steps to have the abattoirs improved, because if they were improved it would be more difficult to get them removed. He is not aware of any special unhealthiness in persons residing near the abattoirs. If the abattoirs were removed the land could be built upon in three or four years; the soil would have to be excavated about three feet, and could be sold as guano, and then the whole level would have to be raised 3 feet above the present level. He would not like to reside there. Since the by-laws regulating the cattle traffic through the streets have been made no one has been injured by the cattle, though there have been some narrow escapes. There are about 2,500 cattle a week passing through the cattle yards. The droppings and urine of all these cattle, and the washings of the yards, constitute the drainage from the yards, the most of which is carried through populated streets to the Moonee Ponds canal, passing into a brick silt pit. The silt pit is under the control of the Lands Department, and is not cleaned regularly. The pit is not deodorized; there have been no complaints about it. The drainage from the western slope of the cattle-yards passes by a drain down the Racecourse Road to the Saltwater River. This drain receives the drainage from some piggeries near the river. The drain is not very offensive, and he has not noticed any silting of offensive sewage round its mouth. The bank of the river just there is in a dirty state for a considerable distance owing to the drainage from the noxious trades. The Moonee Ponds canal starts at Barwise-street bridge, and runs to the Yarra; it is simply a channel excavated in the earth.

GEORGE D. DICKENSON, M.B., Ch.M. Edin.; M.R.C.S. Eng., Health Officer to the Borough of Flemington and Kensington.—Has been resident in the district between seven and eight years, and is familiar with its sanitary condition. He cannot attribute any special case of disease to the existence of the abattoirs or noxious trades, but these have an indirectly injurious effect, inasmuch as the smells from these places induce headache and loss of appetite, and prevent people getting fresh air. The chief smell is from the boiling-down establishments, especially when they blow off steam. He has never suggested any improvements, nor has he used his power under the Health Act to instruct the inspector of nuisances to take steps to abate the smells. The trades might be kept cleaner, but there is not much nuisance from the want of cleanliness. With regard to the abattoirs, nuisance arises from the mode of burying offal in a clay soil, which does not promote speedy decomposition, and in consequence the burying paddocks are one bed of offal, from which a distinct smell arises in summer time. Meat should be killed in a pure atmosphere; it is killed at the City Abattoirs in an atmosphere saturated with septic germs (559, 589, 627), and no matter what system is adopted a pure atmosphere could not be obtained at the present abattoirs, because the site is so low and the soil so unsuitable (626). He has no complaint about the general construction of the abattoirs, with the exception of the floors, which allow blood and animal matter to soak through between the joints and lodge in the ground. There is too much woodwork in the buildings (571 and 572). The fluid that passes in the drains to the river is blood-serum stained with coloring matter, plus the washings of the place, and this tinges the water of the river for some distance. There is scarcely sufficient fall for the drain. There is a deposit of sewage round the mouth of the drain from the accommodation paddocks. The noxious trades on the river are sometimes flooded so as to be 2 feet under water, and the floods bring filth up to the boundary where cattle are killed. The paddocks where the cattle stand are flooded now. The cattle so kept, however, are not

injurious for food (628). There is danger to pedestrians from the cattle being driven through the streets; one street is useless after 10 p.m. on the night known as "cattle night." If the abattoirs were removed the land would be fit to build on in time. If it were filled up for 10 or 12 feet, sloping gradually to the river, it would be easy to cut down Kensington Hill and fill the swamp up, and the present soil might be carted away for manure (627-632). There is land suitable for abattoirs at Keilor Plains with plenty of room for accommodation paddocks, and the only remedy for the present condition is complete removal, the chief objection being that the ground is too low.

Cattle traffic in streets, 628-630.

Utilization of site of abattoirs, 627-632.

Other sites available, 633.

Removal of abattoirs essential, 632.

HENRY ELMSLIE, Valuer and Collector, of Flemington and Kensington.—The Kensington State School is close to the City Abattoirs, and the boys watch the cattle in the yards and see them ill-treated, and also tease them themselves; the boys also see the blood running down to the river in the drain, and the sight of these things has a disgusting and brutalizing influence on the rising generation. There is no protection to the meat on its way from the abattoirs to the city, and it gets covered with dust; in summer some attempt is made to protect the meat, but the covering provided is insufficient. The sheep raise a very fine dust, which is mixed with the sheep droppings, and settles on the meat; the sheep might be brought by train, but the site of the abattoirs is too low for a railway.

Influence of cattle-yards and abattoirs on State school children, 2070-2090.

No protection to the meat in transit from abattoirs, 2090-2093.

BENJAMIN BENJAMIN, Mayor of Melbourne.—The City Council desire to make the City Abattoirs as perfect as possible, and are sparing neither expense nor labour in so doing; a better site could not be found; the abattoirs must be within a reasonable distance of the city, to lessen the cost of the meat.

Desire of Council to improve abattoirs, 4560.

Site suitable, 4561, 4565-66.

EDMUND GERALD FITZGIBBON, Town Clerk of City of Melbourne.—Prior to 1853, slaughtering was carried on by private slaughtermen. Then the City Council leased some land at the foot of Batman's Hill, and erected abattoirs there. In 1855 the growth of the city made difficult the access to the abattoirs from the cattle-yards at the north end of Elizabeth-street, and the Council obtained a grant of land at Doutta Galla for cattle-yards and abattoirs in exchange for the sale of the Elizabeth-street cattle-yards. The advantages of the new site were that it was not too far from the city, the population around it was sparse, and the existence of the racecourse would prevent population coming near. The new cattle-yards were built in 1859, and the present abattoirs were finished in 1860. In the grant of the Doutta Galla site, a condition was inserted that non-use of the land for the purposes for which it was granted for twelve months would incur forfeiture. The Council proposes to enlarge the present buildings and improve the ventilation, to cover in the yards for the cattle, to raise the level of the ground from the slope of the hill to the river, to plant the ground with trees and grass, and to treat all refuse in two of Farmer's machines now in course of erection. It is not proposed to have a railway siding to the abattoirs. When the above alterations are carried out, the condition of the abattoirs will be thoroughly satisfactory. An attempt has been made to obtain a railway siding to the cattle-yards, but it was opposed by the inhabitants of Flemington and Kensington, who do not wish anything to be done that would tend to keep the yards and abattoirs on their present site. It was desired by the cattle salesmen. The upper portion of the accommodation paddocks contains a depression, in which the rain lodges, and cattle going to this would be in mud at the edge of this depression. Statements that cattle are often found in the paddocks up to their knees in mud are exaggerations. There is no grass in the paddocks, but he has seen the cattle feeding on hay there. There are troughs in the paddocks, supplied with Yan Yean water. Except the portion described, the paddocks are not more damp than ordinary land would be. The paddocks afford ample accommodation for keeping and feeding the cattle. There is no charge for keeping cattle in the paddocks. The proposed alterations of the Council will abolish the depression, and establish a uniform fall from the foot of the hill to the river of 1 in 580. It is also proposed to raise McAuley-road, and make an arch under it from the yards to the abattoirs. It is anticipated that these improvements will be carried out in about eighteen months and will cost £15,000. There would be advantages in removing the abattoirs to higher ground, near the cattle-yards, but the advantages would be more than counterbalanced by the local prejudice against having them nearer to habitation, as they then would be; that prejudice is insurmountable; and, further, there is hardly room for sufficiently extensive buildings on the slopes. It would be desirable to concentrate all abattoirs in one spot, as better supervision could be exercised; it would be quite possible from one central abattoir to supply the whole metropolitan area. Present management of abattoirs is satisfactory. There are eight laborers and an overseer, and the laborers are engaged in keeping yards, gutters, and the whole place clean. The revenue last year from the abattoirs was £2,771 3s. 1d. The entire revenue from the time of opening (1861) was £43,094 12s. 3d., the entire expenditure £50,676. The total revenue from the cattle-yards from the time of opening (1857) was £192,005. The noxious trades on the abattoirs site are not satisfactory, and are to be removed; the occupants have always been at the risk of immediate removal. The offensive smells from noxious trades in the vicinity, and even on the other side of the river, are all set down to the discredit of the abattoirs. Country killing of meat for the Melbourne market is a matter to be settled by private enterprise. The City Council proposes to erect chill-rooms in one of their market reserves for meat, as well as for other produce from the country.

History of abattoirs in city, 4576.

Advantages of site at Doutta Galla, 4576.

Tenure of land, 4578-80.

Improvements at abattoirs proposed by Council, 4582-4591.

Siding to yards, 4601-3, 4607-8.

Condition of accommodation paddocks, 4619-4639.

Time taken in making the changes, 4663, and cost, 4647. Removal to higher ground, 4664.

One central abattoir, 4672, 4735-36.

Management and cleansing of city abattoirs, 4679.

Revenue from abattoirs, 4692.

Revenue from cattle-yards, 4701. Noxious trades on abattoirs land, 4703, 4719.

Country-killed meat, 4720-22, 4734.

Objections to removal of abattoirs, 4733.

Case of London markets, 4733 and 4749-42.

Proposed improvements at City Abattoirs, 5147-5173.

No alteration of level where buildings are, 5156 and 5159.

Height of floors above low-water level, 5192.
Filling in of paddocks, 5174-5182.

Instructions as to duties, 636-642.

Number of stock through yards and slaughtered, 643-650.

Keeping of cattle at abattoirs, and feeding, 658-670.

Inspection of cattle, 677-684.

Cleansing of abattoirs, 685-688.

The buildings and their repair, 698-723.

Treatment of refuse, 693-696.
Registration of slaughterers, 723.

Duties, 731-784.

Treatment of refuse, 773, 774, 817-823, 831-836.

The cattle-yards and abattoirs must be in close proximity; if removed to some isolated place, a township will in time grow round them, and in time it will protest, and get the abattoirs moved further afield. Wherever established, the cattle must be brought by rail, and would go through the same process of knocking about. However much pasture land there be around the new abattoirs, it would soon be trampled bare. It is very difficult to drive markets, as instanced by Hungerford and Farringdon markets in London. The area for the cattle market of London at Islington is only 30 acres, and it is surrounded by a dense population; it is supervised by the corporation of London. The largest market in the world is that of Chicago, where they have some 300 acres of land; when first established it was outside of Chicago, now it is surrounded by the city; it was at first a reedy swamp, and has been raised.

ADRIEN CHARLES MOUNTAIN, City Surveyor.—Produced and explained the plans of the proposed alterations at the City Abattoirs. The quadrangular yards at the east and west are to be removed, and their position occupied by covered pens for the cattle, and east and west of these again new killing places are to be erected, higher, wider, and better ventilated. As additional accommodation is required, the present buildings will be replaced by others of approved design. The level of the ground upon which the abattoirs stand is not to be altered. A hydraulic lift will carry all blood and offal to a raised tramway, by which it will be conveyed to the desiccators. The floors are to be impermeable, of natural rock asphalt laid in concrete. These floors will be not less than 9 feet above low-water level in Hobson's Bay. It is proposed to get material for filling up the paddocks from the Harbour Trust; in the deepest part about 3 feet of filling will be required—the average will be about 2 feet.

JOHN GEE, Superintendent of the City Abattoirs and Inspector of Cattle-yards of the City of Melbourne.—Has been connected with the abattoirs for 22 years. Has no other instructions about the discharge of his duties than those contained in the city by-laws. The number of stock passed through the cattle and sheep market during the year 1887 was—Cattle, 114,596; calves, 8,442; sheep, 1,492,900; lambs, 228,930. The stock slaughtered at the City Abattoirs during the year 1887 was—Cattle, 47,017; calves, 5,414; pigs, 6,560; sheep and lambs, 312,782. Such stock as is not slaughtered at the City Abattoirs goes up country or to private slaughter-yards, and no record is kept. Cattle might be kept at the abattoirs a week before they are slaughtered; in that case they are put into pens, provided with racks and water. The corporation provides the water, but not the forage. The people who bring the cattle for slaughter have to do that, according to the by-laws; if they do not place food in the racks, the overseer reports the fact, and then the witness will not allow slaughtering to go on until the cattle are fed. There is no limit to the time cattle may be kept. Occasionally, after the brands have been taken, cattle are allowed to go out to accommodation paddocks—some of the butchers have paddocks outside. The cattle intended for slaughter are inspected directly they come to the abattoir yards. During the year 1887, 210 carcasses were condemned as totally unfit for food. These carcasses were immediately boiled down, and converted into animal guano on the abattoirs reserve. There has been no appeal against the condemnation of these cattle. There is no inspection at private abattoirs. The person to whom a compartment at the abattoirs is allotted has to keep that compartment clean to the satisfaction of the witness, who inspects the premises at irregular times. There is considerable difficulty in getting the cleansing properly done. When not kept clean, the witness locks up the place, and stops the slaughtering until the cleansing is properly performed. The fall from the abattoirs is sufficient to allow the floors to be cleansed by flushing. The fall is about 2½ feet to the Saltwater River. The buildings are continually being repaired. The wooden gratings on which sheep are killed are objectionable, and should be removed. The floor has been raised 18 inches, and the paving renewed. The original paving was not laid in cement, and in some of the compartments the floor is not watertight, and blood soaks through. The portions now being repaired will be watertight, the pitchers being first grouted in with tar and lime, and then with cement over that. The grouting is affected by wear and tear, but when worn is repaired. The coagulated blood and undigested food in the stomachs are buried, and covered with 2 feet of soil, under the supervision of the overseer. The slaughterers ought to be registered or licensed.

JOHN ROBERTSON, Overseer at the City Abattoirs.—Has held the position for the last five years. His duties are to take brands of cattle, keep an account of what is slaughtered, see that the animals are fed, look after the cleanliness of the place and the boiling-down establishments on the Saltwater River, find out when anything is wrong and report it to Mr. Gee, under whose immediate control he is. The place is supposed to be thoroughly cleaned every day when the work is done. If he finds a place dirty he locks it up at once. There are six men at work clearing up. It is part of his duty to supervise the operations in the paddocks, subject to instructions from the Town Clerk and Mr. Gee. The only complaint about the abattoirs that he has heard of is in connexion with the burying of blood and offal. That will be remedied when a desiccator is obtained, and then the abattoirs can be conducted without offence. The blood that congeals on the floor is what is buried—

the liquid part of the blood and the washings pass to the river. There is no difficulty with the drainage. Manure is also buried with the blood, and occasionally portions of offal that have been left. The trenches are 2 to 2½ feet deep, and 2 feet of earth, with the sweepings of the yard and plenty of lime are placed on the top. Water is reached at a little over 2 feet from the surface, and once a flood covered the paddocks between the abattoirs and the Saltwater River. The same ground has not had blood buried in it more than once. The paddocks in which burying has taken place years ago are not offensive; where the burying occurred only a few months ago there would be an offensive smell when the ground was disturbed. The smell that is complained of, and that blows over to the racecourse, comes from the boiling-down establishments on the river. The nearest habitation is about 400 yards off, at Kensington. The cattle are kept in the paddocks, between Newmarket and the slaughter-houses, and also and more generally in pens and pitched yards next to the abattoirs. There is no roofing to them. There is a constant supply of water and a place for food in every yard, and the cattle are supplied with food, and in proportion to the number to be fed (831). The paddocks are not pitched, and in wet weather the cattle stand in mud, but not up to their knees. A Government inspector of stock attends occasionally at the abattoirs. Witness lives near the abattoirs and has had good health. The cattle could all be brought to the abattoirs by a railway, except a few dairy cattle. The cattle are knocked about between the sale-yards and the abattoirs.

Treatment of cattle, 798-816.

Accommodation paddocks, 802-807.
Inspection of stock, 791-797.

Railway to abattoirs, 864-876.

JOHN TAYLOR, Inspector of Central Board of Health.—Frequently inspects the City Abattoirs. The site is too low, so that the yards are swampy, and in winter the cattle are up to their bellies in mud and filth, and may be kept in that condition for five days. The cattle are fed with inferior hay, sometimes placed in racks, sometimes on the ground. Has never seen them without food. There is not sufficient fall in some of the pens at the abattoirs buildings, so that blood-stained fluid lies about, and when not swept up becomes offensive. The outfall drain is sufficient to carry off drainage if the gratings across it are attended to, if not the drainage would overflow. There is frequently stagnant fluid in the drain from the sheep killing places. The fall in the drain is so slight that it would require a very strong force of water to sluice it clear with a hose. The wooden gratings on which sheep are killed are not lifted sufficiently often, being too large and heavy, and consequently blood and filth accumulate under them. The floors are in fair condition, but refuse has been at times left in the compartments where beef is hung, and becomes offensive in summer. There is a difference between the cleanliness of some of the pens and others. The fat and other refuse which is removed to factories is not removed soon enough, and being placed in a heap instead of hung on racks to dry, it soon becomes offensive. The corporation undertakes to remove the offal and debris, and provides carts for that purpose. The arrangements for removing horns and hoofs are satisfactory; they are not left about. The accommodation for the butchers who want to slaughter is not nearly sufficient. The hanging pens are unsuitable, being too confined, and the meat hangs too close together. The carcasses ought to be separate to allow of ventilation. The method of treating blood and the contents of the stomachs and offal is very offensive. Trenches are dug about 18 inches deep, and these matters are thrown in with a great deal of water and blood, and the water is forced back into a side drain and flows over the paddock. An offensive smell arises from the ground in which burial has taken place, quite distinct from the smell of the noxious trades, and not coming from trenches at which burying is going on. All the carcasses of animals slaughtered at the abattoirs are not inspected. The animals are inspected at the market, but it is possible that diseased carcasses may pass from the abattoirs without being properly inspected. Cattle have been known to come into the abattoirs from the Footscray side, and to be slaughtered without any account of them being taken by the corporation officials. The meat taken from the abattoirs is covered. Sheep's heads ought not to be removed with the skins. The skins pass to stores in town, and then may be passed from one store to another with the head still attached, often decomposing. In London sheep's heads are skinned and the head sold for food. The site is not good, but by levelling, filling up the paddocks and draining, reconstructing better and larger buildings, and adopting suitable regulations the city slaughtering could be carried on without detriment to the surrounding population. The treatment of blood and offal by a desiccator would not remove all source of complaint, but with increased vigilance and better methods of carrying out the regulations, it would go far towards satisfying all requirements.

Site and condition of cattle-yards, 1854-1863.

Drainage of abattoirs, 1970-1975.

2038.

2041.

Cleanliness, 1979-1981.

1937-1988.

Removal of refuse, 2060-2007.

Removal of horns and hides, 2031-2035, 2018.
Accommodation and ventilation, 2012.
1983.

Treatment of blood and offal, 1994.

Inspection of meat, 2046-2049.

Covering of meat in transit, 2050-2054.
Treatment of skins, 2055-2065.

Possibility of preventing offence at abattoirs on present site, 2009-2016, 2034-2036.

JAMES JAMIESON, M.D., Health Officer of the City of Melbourne.—Has frequently visited the City Abattoirs. Abattoirs could be erected on the present site suitable for Melbourne, but they might be in a better situation. There is hardly sufficient fall in the drains now existing within the buildings, but there is sufficient fall from the buildings to the river. The method of dealing with blood and refuse by burying has not been injurious to health. It is not desirable that so much blood should pass into the river as passes in now. There is no objection to burying the contents of the paunches, and so raising the ground. Some of the noxious trades on the Saltwater River, especially the boiling-down establishments, are a nuisance. The gut factory is not well managed. Has not been able to detect any smell from the abattoirs or trades at a distance less than that from the nearest dwelling-house, but there is an offensive smell in the valley of the Saltwater, and such smell would be worse for the meat in the abattoirs than a pure atmosphere. The noxious trades ought to be

Site suitable, 5771-75.

Drainage, 5776-79.

Treatment of blood and offal, 5780-83.

5847.

Condition of noxious trades on Saltwater River, 5784, 5805.

Removal of the noxious trades, 5796.

Effect on health, 5798, 5802.

Removal of abattoirs, 5806, 5808.

5843.

5858.

Suburban abattoirs, 5811-13 and 5835-41.

Inspection, 5809, 5822-30.

Marine stores, 5860.

Prosecutions by inspectors, 5875-91.

Flock factories, 5892, 5905.

Raw hides, 5907-8.

removed. The odours from the noxious trades may readily cause injury to health indirectly. From a purely sanitary point of view, every noxious trade, including abattoirs, should be removed from the neighbourhood of the metropolis; but from a practical standpoint, the abattoirs might be retained where they are, with improvements, and no injury need result to the health of the inhabitants as the district is inhabited now. Things being equal, if a better site could be found, they should be removed to a better site. If they remain, the whole level should be raised. Abattoirs could be conducted with proper appliances in a populous community without offence. Has visited some of the suburban abattoirs and found them in a bad condition. As soon as strict precautions were taken at the City Abattoirs to stop the killing of diseased meat, it found its way to other abattoirs where there was less supervision. The number of abattoirs should be reduced; there should be more centralization; probably two abattoirs, northern and southern, would suffice. The inspection at the City Abattoirs is fairly satisfactory. He understands that it is part of the duty of the inspectors to see that the meat is properly protected when it leaves the abattoirs, and it is protected, but not always efficiently. The marine stores in the city have not been well conducted; they ought to have watertight floors. Notice has been given that those in the city must improve their premises. It is difficult to make them altogether free from offence. He would be glad to see such places abolished; they are useful now, because the scavenging arrangements are not sufficient. The scavengers do not clean people's yards. If an inspector finds anything offensive, he orders its removal; if it is not done, the inspector reports to the Health Committee, and gets leave to issue a summons. An inspector does not prosecute on his own responsibility, notwithstanding section 26 of the Health Act. Flock-making may be easily injurious to health; it ought to be regulated by Government, so that the rags should be properly cleansed and disinfected. Raw hides would be better kept outside the city.

HENRY CHARLES BOWSER, M.R.C.S., Health Officer of the Shire of Braybrook, and President of the Footscray Sanitary Association.—The City Abattoirs in their present condition give rise to a nuisance. The site is unsuitable, being too low and swampy, and difficult to drain. The buildings are unsuitable, being low, ill-ventilated, and unnecessarily subdivided; and the floors of flags and pitchers are unsuitable, allowing soakage through the interstices. The burial of offal is deleterious to health, and produces disease germs. He is not aware of any distinct cases of disease arising from the present situation or conduct of the abattoirs, and his opinion that the abattoirs are detrimental to health is merely based on analogy. Noisome exhalations arise from the paddocks in which burial of offal has taken place, and these exhalations would influence unfavorably the keeping qualities of meat killed and hung in such an atmosphere. The nuisance from the abattoirs could be removed by treating offal in destructors, by raising the level of the land, and reconstructing the buildings; and he would recommend that the abattoirs be retained on the present site with alterations. Abattoirs could be carried on without offence in the centre of a city if conducted with proper appliances. The abattoirs at Calcutta were built eight or ten years ago, and are very strictly supervised under the management of the municipality. They are in the city, and all the cattle must be killed there. The blood and offal are carried away by a special railway, which also carries the nightsoil, to an inlet of the sea 30 or 40 miles away. The cattle are inspected during life and branded; after killing, an inspection is made to see that only the branded cattle are killed. Then the meat is inspected, and classed and branded according to the quality. Rejected meat is destroyed under inspection. There is no supervision over meat coming from private slaughter-houses near Melbourne. He has seen diseased meat coming from near Braybrook. Meat is not properly protected in transit, and he has seen it uncovered. Butchers' stalls require supervision, as bones, trimmings, gut, livers, &c., are allowed to accumulate. The noxious trades on the Saltwater River are a nuisance, but chiefly to the senses. They pollute the river and its banks by discharging their drainage, and even offal, into the river. These trades could be carried on without offence by proper appliances. The bone and manure mills cause the greatest offence, and this arises from drying the material in close rooms; if spread out in thin layers and freely exposed to the air, the offence is much minimized. Small establishments create more nuisance than large ones, as they cannot afford the appliances necessary to prevent offence. There will be constant risk of defilement of the river if gut factories and the like are retained on its banks.

WILLIAM HENRY PROHASKY, Mayor of Port Melbourne.—Has been resident in Port Melbourne about eight years, and is familiar with the Port Melbourne abattoirs. With the exception of the drainage, they are in a satisfactory condition. The Harbour Trust has constructed a drain which fails to carry away the drainage. The corporation holds the site under a ground-lease of occupancy from the Board of Land and Works. The abattoirs are let by public contract for £100 a year on a three years' lease. The present lessee conducts the business in a satisfactory manner. The abattoirs are a great convenience to local butchers, but the residents could be supplied from the metropolitan abattoirs without great difficulty. It would be better to have one south suburban abattoir from which the municipalities on the south side of the river could be supplied. An inspector should be appointed by the Government to inspect all meat before it goes into consumption.

Condition of Port Melbourne abattoirs, 5413-5420.

Drainage, 5416-17.

Tenure, 5421.

Question of one central abattoir, 5424-27.

Inspection of meat, 5428-31.

EDWARD CLARK, Town Clerk of Port Melbourne.—Coneurs in evidence of Mayor 5436.
of Port Melbourne. The original drain from the abattoirs was obliterated by the
Government, and was interfered with by the Harbour Trust, and the difficulty
in regard to drainage has been created by the Government and the Harbour Trust,
and not by the corporation. Pigs used to be kept at the abattoirs. The abattoirs is
in the area in which people may keep pigs. He has not visited the abattoirs for two
years, and can give no information as to its present condition. The total revenue
from the abattoirs is £100 per annum. The Council has spent over £2,000 on the
premises. There is no regular periodical inspection, and no practical supervision
except occasional visits from the Inspector of Nuisances and the Health Officer.
The proposal to have one southern abattoir has been discussed in conference by the
Councils of St. Kilda, South Melbourne, and Port Melbourne. St. Kilda has
withdrawn, and Williamstown opposed a proposal to reserve a portion of land in
Fisherman's Bend for that purpose. The chief inconvenience arising from the
abolition of the local abattoirs would be to the butchers who supply the shipping.

Main drain from
abattoirs, 5437.
Difficulty in drainage due
to Harbour Trust and
Government, 5437.
Pigs at abattoirs, 5447.

Revenue, 5467.

Inspection, 5469-72.

Southern abattoir, 5473.

Abolition of the Port
Melbourne abattoirs,
5474.

THOMAS SMITH, Mayor of South Melbourne.—Is familiar with the South Melbourne
abattoirs, and does not consider their condition quite satisfactory, the chief defect
being in the drainage. The liquid refuse is conducted to the River Yarra by a
wooden shoot, and near this shoot and near the abattoirs buildings are stagnant
pools. These pools are caused by the Harbour Trust having filled up the ground
between the abattoirs and the river. From the same cause the cattle-yards are not
properly drained, and are boggy. There is no shelter in them for the cattle. The
present abattoirs are a great convenience to South Melbourne, and could be retained
in their present position without injury to health. There would be difficulty in the
summer in supplying South Melbourne from the metropolitan abattoirs. When
Mr. Tucker was Minister of Lands the Port Melbourne and South Melbourne
Councils interviewed that gentleman on the subject of the abattoirs, and it was
suggested that a site for abattoirs could be found at Caulfield, but the Caulfield
people objected. Then Oakleigh was suggested, and the butchers of South and
Port Melbourne objected on account of its distance. When Mr. Dow became
Minister he suggested a conference of the local bodies concerned with the Central
Board of Health, but that was not carried out. The Council would like the Minister
of Lands to raise and improve the present site or exchange it for another. If the
Council had a permanent tenure of the site they would be prepared to improve it and
erect a desiccator.

Condition of South
Melbourne abattoirs,
4756.

Defective drainage,
4759-4771.

Caused by Harbour
Trust, 4764 and 4772.
Cattle-yards, 4773-4782.

Abolition of the abattoirs,
4791-94.

Previous negotiations,
4797.

Proposals of the Council,
4800.

4820 and 4825.

FREDERICK GEORGE MILES, Town Clerk of South Melbourne.—Coneurs in the evidence 4834.
of the Mayor of South Melbourne. Neither the site, drainage, buildings, or out-
buildings of the South Melbourne Abattoirs are satisfactory; and no radical improve-
ment can be made on the present site. If improved methods of transit for the
meat were provided, there would be no serious difficulties in supplying the residents
of the district from the metropolitan abattoirs; but the butchers who supply the
shipping would find difficulty at times in getting meat on board in time. There has
been considerable difficulty in getting the southern municipalities to combine and
erect one abattoirs. A conference on the question was held, but without result—
they could not agree on a site, and St. Kilda withdrew. In 1887, the Councils of
South Melbourne and Port Melbourne held a conference, and decided that they were
prepared to expend a sum not exceeding £10,000 on suitable buildings. The
Minister of Lands selected a site at Fishermen's Bend, but Williamstown objected.
The abattoirs are let at £150 a year, and the only expenditure is for necessary
repairs. The Council is not satisfied with their existing state, but is powerless to
improve the place while they have such an insecure tenure. The Council has no
objection to the abolition of the abattoirs; but the Government must, in that case,
make provision for the slaughtering requirements of the city, and compensate the
Council for the loss of the present income derived from the site.

South Melbourne
Abattoirs unsatisfactory,
4836.

Supply from City
Abattoirs, 4839-45.

One Southern Abattoir,
4846-51 and 4855-57.

Revenue and expenditure
on the abattoirs, 4852-54.

Abolition of the abattoirs,
and compensation,
4858-4861.

JOSEPH BRADY, Chief Engineer to the Harbour Trust.—Denied the statement that the
difficulty in draining the South Melbourne and Port Melbourne Abattoirs has arisen
from the works executed by the Harbour Trust on the bank of the River Yarra.
Prior to the Harbour Trust works, the abattoirs drained into a sort of lagoon between
the abattoirs and the river, and there was no adequate drain from the abattoirs to the
river. The Trust has constructed a stone-paved drain, and into it all the drains of
the abattoirs run. Another drain was made for the Port Melbourne Abattoirs. The
drain is perfect if kept flushed. Depressions in the ground near the abattoirs have
existed all along, and drainage may escape into them—the remedy is to fill them up.
The abattoirs buildings are practically of no value. The wooden drains from the
abattoirs should not be allowed; the drains should be of impervious material.

Harbour Trust works on
river bank and abattoirs,
5124.

JOHN HARKES CRAIG, Mayor of Williamstown.—The drainage from the Williamstown
Abattoirs is unsatisfactory, as it flows into a swamp. The present mode of burying
blood and offal is perfectly satisfactory; the only complaints about it have been
from the Inspector of the Central Board of Health. The condition of affairs found
by the Commission on its visit must have been exceptional. With the present site
the drainage cannot be improved. It could be taken to the Kororoit Creek, but at
great expense—more than the Council is prepared to pay. The Council desires to
have another site near the Kororoit Creek. It is not absolutely necessary that there

Condition of Williamstown
Abattoirs, 6249-6265

5271.

Supply from City
Abattoirs, 6266-7.

Keeping of pigs at
abattoirs, 2563-70,
2561-65.
Improvements, 5258.

should be abattoirs at Williamstown. The meat supply could be obtained from the Metropolitan Abattoirs if proper arrangements were made for its conveyance. The lessee is allowed to keep four pigs at the abattoirs—sometimes there are more there; they feed on the blood. The sties are satisfactory. It is not desirable that pigs should feed on the blood, or be kept at the abattoirs. The only improvement proposed by the Council is to remove the boiler from under the roof of the beef slaughter-house.

5279.
Difficulties of site, 5282.

GEORGE FREDERICK SMITH, Town Clerk of Williamstown.—Concurs in evidence of the Mayor of Williamstown. It would be very difficult to so conduct the abattoirs on the present site as not to be a nuisance. It would cost nearly £1,000 to take the drainage from the present site to the Kororoit Creek. The site the Council desires is on the west side of the rifle butts reserve, close to the Kororoit Creek. The nuisance from the swamp has partially arisen from the fact that a quantity of waste water has been emptied into it from the Freezing Co. and from the Newport Gas-works. Formerly, when the swamp was dry, the drainage was caught in pits, deodorized, and carted away. Now the water flows over the pits, and this cannot be done.

Site desired, 5285-90.

Drainage, 5293-94.

Site of abattoirs suitable,
3943-43.
Condition of paddocks,
3949-53.

THOMAS KNIGHT BENNET, Butcher.—The present site of the Metropolitan Abattoirs is a suitable one. The accommodation paddocks are small and much used. They have not been under water for some years, and are not flooded by every heavy shower of rain. The yards where the beasts are kept before slaughtering are wet and dirty, and have no shelter. The footsore cattle cannot lie down, and they get inflammation through the whole body, and they deteriorate if kept three or four days there. There are no parts of the buildings where the drainage is insufficient or without sufficient fall. Blood does not collect between the pitchers of the floors. The wooden frames on the floors are kept clean; blood lies under them during killing, but it is not offensive, and it is frequently removed. The floors are kept clean. The ventilation is not sufficient, but could easily be remedied by putting in louvres, &c. The paddocks where blood is buried have not been recently flooded. There may occasionally, but not commonly, be water in the trenches where the blood is buried. Has never noticed any evil smell from these paddocks. There is only occasionally an offensive smell in the valley of the Saltwater River coming from the boiling-down establishments in the summer time. When the waste of the business is boiled down fresh every day there is no offensive smell, and the steam pipes lead from the vats into the fire. The atmosphere in which the meat is killed is pure. The meat is properly inspected, both before and after killing. The chief sources of cattle supply for the Melbourne market are New South Wales, Gippsland, and Queensland; about 35 to 40 per cent. come from New South Wales and Queensland, and are trucked down, changing trucks at Albury and Wodonga. Sale and Traralgon are the chief centres of the Gippsland trade. The chief supply of sheep is from New South Wales. A large proportion of the cattle are injured in trucking and on the journey; they are seldom killed outright. Sheep don't suffer so much. After sale at the yards the cattle are placed in the accommodation paddocks at the abattoirs, and usually kept there about a week (4099). The witness has private paddocks, 2,500 acres, at distances varying from one to five miles from the yards, to which he regularly transfers his cattle. The meat from cattle that have rested some days before killing in good paddocks is tender and wholesome food; that from cattle killed in an excited state shortly after selling is unwholesome food (4040). He does not think a system of killing in the country could be adopted for sheep. The meat is too much handled. If chill-rooms were established at terminal stations there should be no difficulty in bringing dead meat from Wodonga, Echuca, and Sale, but it would be impossible without cold chambers. There would be no difficulty in obtaining the main meat supply for Melbourne from an abattoirs 30 miles away in the country, provided satisfactory arrangements could be made with the Railway Department. Chilling to 40° F. does not injure meat; it improves it. Up-country abattoirs would be best erected by private enterprise. The suburban abattoirs should be retained, and should be inspected. Removal of the noxious trades to a distance from the abattoirs would entail an expense that would be prohibitory to their successful working. If removed, the offence from the trades would be worse, because the material would be kept longer before being treated. It would be an advantage if the railway came up to the yards. The cattle would be less irritated. There is no difficulty in bringing the railway there, but the Flemington Council opposed it.

Of yards, 4082.

Drainage of buildings,
3954.

Cleanliness of buildings,
3965-71, 3975.

Ventilation, 3972.

Treatment of offal,
3977-84.

Offensive smell in Salt-
water valley, 3986-93.

Atmosphere pure, 3993.
Inspection of meat,
3996-4000.
Sources of meat supply,
4001-3.

Injuries to beasts in
truckings, 4023-32.

Private paddocks,
4018-22.

Country killing, 4035-53.

Effect of chilling on meat,
4014.
Private enterprise,
4047 and 4051.
Suburban abattoirs,
4066.
Relation of noxious trades
to abattoirs, 4066-68.

Railway to yards,
4088-93.

Site of abattoirs unsuit-
able, 4106-8.

JOHN WOOLCOCK, Butcher.—The present site of the City Abattoirs is an unsuitable one; it is low, cattle are up to their knees in mud, and there is not sufficient room. It would be much better if the cattle-yards and abattoirs were removed out of town. Carcasses have to be crowded together in a badly-ventilated building. A pitched floor is best for the killing pen, because the cattle do not slip on it. Asphalt will not stand. The atmosphere at the abattoirs is pure. He concurs in Mr. Bennet's evidence as to sources of meat supply, and the injury received in transit. A large proportion of cattle are killed in an excited and feverish state. Beef killed in the country is better in quality, but gets knocked about in transit. If there were proper abattoirs in the country, with cooling chambers and proper means of trucking, and a market, the meat would be better than as now killed at the abattoirs. Chilling cars would probably be required if the meat were brought more than 50 miles in summer. The system should be carried out by private enterprise, but the Government should

Overcrowded, 4111.

Floors, 4114.

Atmosphere pure,
4123-24.

Country killing, 4140-56

provide the chilling arrangements at the termini. Suburban abattoirs should be abolished, but the central abattoirs should be enlarged. Suburban abattoirs could be efficiently inspected by an inspector appointed jointly by the local bodies.

Suburban abattoirs should be abolished, 4157-58.

Inspection, 4159-63.

JOHN PRITCHARD, Wholesale and Retail Butcher, Slaughterman, and Grazier.—The site of the City Abattoirs is unsuitable for killing operations, and the ground is too low for the accommodation paddocks. The abattoirs do not provide sufficient accommodation. To be made suitable, the ground must be raised with earth obtained elsewhere, and the whole building reconstructed. Stock suffer in the paddocks. Owing to the want of drainage, they often stand half-way up to their knees in mud, and they deteriorate in condition. Cattle are kept in the paddocks two to ten days; a small proportion are killed the same day, about one-third on the second day, and the rest at varying periods after sale. If kept three or four days, the meat is improved, but after four days it deteriorates—it loses “sap.” The cattle are kept to suit the convenience of the trade. The cattle do not eat much the first two or three days; some do and some do not; it depends on the kind of cattle. It would be a great advantage to have a siding to the cattle-yards. The inspection of the abattoirs is satisfactory. The general health inspector and the inspector of the Central Board of Health inspect the suburban abattoirs. He does not think diseased cattle are taken to the suburban abattoirs to avoid inspection at the central abattoirs. An inspector should be appointed for the suburban abattoirs. The suburban abattoirs are a benefit to the trade and to the public, and it would be a great inconvenience to abolish them, especially in summer. One abattoir for the south side of the Yarra would be sufficient, but two would be better. It is a mistake to concentrate the business. The condition of meat would be improved if it were killed in the country. Over five per cent. of the cattle coming from the Murray are bruised in the trucks, and this would be saved if they were killed at Wodonga or Echuca; but there would still be the bruising in getting to these places. To establish a trade in country-killed meat would require chilling rooms, proper cars, and a proper market. The cost of storage and shifting would greatly increase the price of such meat, and the charges would be increased by the difficulty of dealing with the hides and tallow and offal in the country. In London there is both a live meat and a dead meat trade, and a large proportion of the meat comes to London dead from all parts of England and Scotland. The cattle market, meat market, and abattoirs are in the heart of the city, and all adjacent. Some of the killing is done on the butchers’ premises. A trade in dead meat will probably be gradually established by private enterprise.

Site of City Abattoirs unsuitable, 4977-82.

Insufficient accommodation, 4975-76.
Necessary improvements, 4978-81.
Effect on stock, 4985-91.

Time stock kept before killing, 4992-5001.

Effect on meat, 5002-4, 5005-7.

5009-12.

Siding to cattle-yards, 5015.
Inspection of abattoirs, 5013.

5015-20.

5021.

Suburban abattoirs should be retained, 5014 and 5021.

5026-29.

Country killing, 5039-C3.

London meat trade, 5047-51.

JOHN PENRALLURIACK, Butcher.—Carries on business at Brighton; buys most of his meat alive at Newmarket, and kills the beef at the St. Kilda Abattoirs, and the mutton and small stock on his premises. His business would be seriously inconvenienced if he had to get his beef killed at the City Abattoirs; and is afraid no arrangements, with the railway or otherwise, could be made to obviate the inconveniences. Does not approve of one abattoirs for the southern suburbs, but would have a number of small slaughter-houses; they are easier to keep clean. Has seen all the abattoirs around Melbourne, and thinks they are kept as they should be.

Effect of one central abattoirs on his business, 6029-40.

One southern abattoirs, 6046.
6044-85.
6049-55.

ARTHUR GREY KENWAY, officer in charge of works connected with the meat trade, Sydney.—Furnished a report describing the Glebe Island Abattoirs and its accessories; and in reply to questions 2641-2660, gave information in regard to details of construction. Meat reduced to a temperature of 40° F. is said to be chilled. Meat can be chilled and kept chilled for twenty-four hours for 5s. 10d. per ton, at eighty tons per day; and 11s. 8d. per ton, at twenty tons per day. Meat once properly chilled can be transferred to the ordinary summer temperature for a day or two without deterioration. He has designed a car for meat that could be charged with cooled air from stationary machinery. If owners of meat were to properly chill the meat at their own depôts, it could be kept chilled in such cars. Abattoirs should be connected by rail with the places from which stock come, thus avoiding the driving of stock through suburban roads, and the fevered condition into which such driving puts them. A site for abattoirs should not be low. The site of the abattoirs at Flemington is objectionable for this reason—there is not a proper fall for the gutters, and there is not a proper atmosphere. To obtain this the elevation should be 30 or 40 feet or more above sea level. There is no compulsion to kill at the Glebe Abattoirs; probably more than half the stock for the Sydney market is killed there, and the rest at private abattoirs. There is no inspection of the meat at these. The present system of desiccating at the Glebe Abattoirs is about to be discontinued, and instead the blood and waste are to be deodorized and conveyed away in punts to be treated by “the Cattanaeh process.” At present the valueless manure from the sheep’s paunches, the final sluicings of the floors and gutters, and the soup from the digesters is conveyed to sea in punts. The whole of the meat system is in the hands of the Government. The meat market at Darling Harbour, where meat is sold by auction to the retail butchers, is under the control of the Railway Department, and is an adjunct to the railway, to receive meat killed not only at the Glebe but in the country, and conveyed to Sydney by rail. The market is incomplete at present; notwithstanding this, and the other disadvantages entailed by the unnecessary handling of the meat (the whole system being in crude state), and the special advantages possessed by the Messrs. Richards, it still pays country killers from Goulburn, Moss Vale, Orange, and other districts to send meat down to this market. No special meat trains are

Chilling meat, 2653, 2621.

Cold cars, 2621.

Stock taken to abattoirs by rail, 2606

Abattoirs should be elevated, 2674-80.

Proportion of stock killed at Glebe, 2627.

New method for blood and offal, 2653.

Punt service, 2636.

Meat market at Darling Harbour, 2697-2711.

Country meat trade in N.S.W., 3491

3485.

| | |
|--|--|
| 3482. | |
| 3487. | |
| Distance meat can be brought, 3514-16. | |
| 3517-18. | |
| Operations of the firm, 3577-3601. | |
| Treatment of stock, 3583-89. | |
| Time of slaughtering, 3590. | |
| Cost of train, 3600. | |
| Number of carcasses to a truck, 3601. | |
| Kind of truck used, 3537. | |
| Chilling no benefit to them, 3592-3668. | |
| Results of their trade, 3596-98. | |
| Advantages of their system, 3632. | |
| Effect of chilling meat, 3570. | |
| Keeping of chilled meat, 3707-9. | |
| Distance meat can be brought without chilling, 3711. | |
| Cost of chilling, 3716. | |
| Details of arrangements for slaughtering, 3603. | |
| For sheep. | |
| For cattle, 3607. | |
| Advantages of raised floor, 3615. | |
| Treatment of refuse, &c., 3617. | |
| Treatment of blood, 3619. | |
| Inspection, 3150. | |
| Dead meat trade, 3529-75. | |
| Cattle and sheep from Orange, 3529. | |
| Results, 3534-37. | |
| 3559-61. | |
| Mutton from Goulburn, 3542. | |
| Treatment of the cattle, 3563-3575. | |
| Country-killed meat, 3809-29. | |
| Bruising in truck'ng, 3812-14. | |

run as yet. The only check to prevent country killers sending down diseased meat is that any inspector or sub-inspector of police can condemn meat which is unfit. The butchers do not receive meat from the country direct; it passes through the hands of agents or carcass butchers. Meat killed the other side of the mountains and brought over the mountains in a night, can be safely brought to Sydney without chilling; over flat country it could not be so carried more than thirty miles. If meat is to be brought more than thirty miles over flat country in summer it would be necessary to chill it first. A refrigerating chamber at the town dépôt as well is not essential.

ROBERT RICHARDS, member of Riverstone Meat Company.—His firm kills stock at Riverstone, about 30 miles from Sydney, where they own about 2,000 acres immediately adjacent to the railway. The stock are bought in various parts of New South Wales, chiefly from the Hunter district, and driven by road to Riverstone, being rested for a day at a dépôt at the foot of the Bulgoa Mountains, and again at Boggy Swamp. When they arrive at Riverstone they are paddocked, the time they are kept varying according to the supply coming for market. In summer, killing begins at 6 p.m., the meat leaves at 3 a.m., and arrives in Sydney, by special train, about 4.30 a.m. The special costs £15 a day for twelve trucks, and £1 for every extra truck. Each truck carries nine bodies, which are hung from bars, and the trucks are covered in and louvered. There are no chilling operations at Riverstone—they would not be any benefit. In Sydney, the firm acts as wholesale butchers, selling both by auction and privately. They do not store the meat, but clear it out without reserve every day. They have been able to compete satisfactorily against Sydney killed meat, and do a business of 400 bullocks and 5,000 sheep a week. They have now no losses from decomposition of the meat; before they had a special, they had slight losses from this cause. The advantages of their system are—that if cattle are rested, and judiciously fed and watered, there is a saving in the quality of the meat, in the weight and fat, which may be estimated at about 10s. a bullock. There is nothing lost in chilling meat, and the meat is just as good provided it be not exposed to a lower temperature than 40° Fahr. Meat chilled while quite fresh will keep longer than unchilled meat when taken out of the chill-room. If chilled meat putrefies when cooked, it is due to its having been decomposed before it was chilled. Meat, even after having been reduced to 40° Fahr. for 24 hours, will not keep above 24 hours exposed to the ordinary summer temperature; but he believes chilled meat will keep longer than freshly-killed meat. Meat could be brought 60 or 70 miles by a special train without any chilling. The cost of chilling at Mort's is a half-penny, and of freezing, a farthing, per lb. The sheep, 1,000 of which can be killed in one day, are driven up an inclined plane into drafting pens. They are taken from these by the butchers, and killed on a floor of open battens raised 8 feet from the ground, and the blood falls through this open floor on to a cemented floor below, and runs away by drains. All offal is thrown down a shoot on to the floor below, and is thence taken to the boiling-down house. The cattle are driven up a drive with converging sides to the killing-place, the floor of which is raised from the ground. One pithing pound is floored with stone, the other with cement. The advantage of a raised floor is that the offal gets clear away, the men are cleaner, and there is more air to take the animal heat out of the carcasses. Hides are salted, and sent to London. Offal is boiled down in closed digesters, which are cooled down before being opened. The boiled meat from the vats is given to pigs, the bones are ground, the soup is put on the land, and the blood is distributed over the land in the same way. Land so treated is very productive. There is an inspector, a police officer, who inspects the meat daily.

JOHN EVANS, Sydney agent for firms killing stock in the country.—The dead meat trade was commenced about eighteen months ago. The first country-killed meat came from Orange, 192 miles distant. It was trucked about 11 o'clock, and arrived in Sydney early the next morning in prime condition. Last year the trade was limited to seven and a half months, being discontinued in October, when the weather became too hot. The results have been very satisfactory. He has never lost a half per cent. on any consignment. About eight trucks a week come from Orange, twelve head of bullocks on each truck—48 quarters. Has had no losses from meat arriving decomposed—never any condemned. The mutton comes chiefly from Goulburn; it is killed the day before trucking, and comes down in about nine hours. A few consignments come from Rookwood, Springwood, Parramatta, and Queanbeyan. There are no chilling appliances in any of the districts. Both Orange and Goulburn are at a considerable height above the sea. There is no surplus stock—it is all sold on the same day. Without artificial methods meat could not be brought down in the hot months. Most of the cattle killed at Orange are reared in the district. Sometimes they may be travelled 100 miles, sometimes 10. They are kept on pasture land before killing, and put in a starvation paddock for a day before killing. There is a siding to the slaughter-yard. There are the same conditions at Goulburn. All stock gets knocked about in trucking, and suffer more than when driven, and the meat does not keep so long.

THOMAS PLAYFAIR, Shipping Butcher, Sydney.—Meat killed in the country is far better than meat killed in the metropolis. Stock is a good deal bruised in trucking, and it is possible to distinguish the country from the town-killed meat by the amount of bruising. The country-killed meat is selected meat; an owner kills his best cattle,

and sends the poor ones down alive. The meat at present coming from the country is unusually well killed; the cattle have plenty of rest, with good grass in good paddocks, but all owners have not these advantages. Much of the cattle must be travelled to Bourke, say, and if killed there would not be better than if killed in Sydney. If good seasons could be commanded, and all stations were within a few miles of a railway, it would be best to kill on the stations; but many owners have to drive their cattle 400 or 500 miles to Bourke, and when they have come so far they might as well come on. An owner who sends his cattle in alive has the advantage financially, because he sends everything in one truck; an owner who sends his meat will have to subsequently send his hides and his tallow; he would have to get his cooperage up, and keep a staff of coopers and men to salt his hides. He is in favour of both country and town killing, so that there is a competition between the two. If country killers solely had to be depended on, in bad seasons they would not have the cattle, and in good seasons they could command the market, and get the price they wanted. At present country-killed meat commands a farthing a pound more than town-killed amongst a few butchers; last summer it frequently was sold at less. Messrs. Richards are the only suppliers of country-killed meat in the summer, but theirs can hardly be called a country killing place, being only 30 miles from Sydney, and the cattle killed there are bought all over New South Wales. Whether they get some days' rest before they are killed depends on the market. No one could kill the quantity of stock the Richards do and keep them any time. Their paddocks would have nothing in them if they did so. Chilling does not injure meat; in fact he thinks it improves it, provided it is quite free from taint when chilled. The Bell-Coleman process of freezing is the best. Mort's charges are half-a-farthing a pound for chilling, and a farthing for freezing; a half-penny used to be charged at Glebe Island. Killing establishments in the country ought to be under municipal or Government control; whether under municipalities or private individuals, they can be dealt with by by-laws. In the country, private people should erect them; in the city, the municipality or Government should build them. Abattoirs can be built so as to be without offence in the middle of a city, as in Montreal for instance. Noxious trades should not be near abattoirs; if they are, the nuisance from them is ascribed to the abattoirs. They should not be too far away, because they use up a large amount of offal, and this becomes a nuisance in being carted a long distance. It would be advisable to keep the noxious trades together, under strict inspection, and with a good tenure. In the past people have started noxious trades in barren country, miles from the city; then people build near because the land is cheap, and then indict the noxious trades as nuisances. As these noxious trades have no secure tenure, they expend no money on proper appliances and drainage. Such places should be built of stone or concrete, well cemented, with good drainage and plenty of water for flushing, and good ventilation. Noxious trades, like soap-making and boiling-down of tallow, could be carried on in a city; though the smell is disagreeable it is not hurtful; they are better away, however. It is not advisable to have a number of little boiling-down places throughout the country. There is more nuisance in connexion with small establishments than large ones. There ought to be inspectors for every abattoirs.

Difficulties in way of country killing becoming general, 3816-22.

Should have both country and city killing. 3822.

Prices of country and city-killed meat, 3823.

Messrs. Richards' business, 3825-29.

Effect of chilling, 3830-32.

Best process, 3834-39.

Charges, 3837-38.

Supervision of country killing establishments, 3843-45.

Who should erect them? 3844.

Need be no offence in city, 3841.

Noxious trades, their relation to abattoirs, 3847. Not too near.

Might be grouped together 3848.

3855.

3856.

WILLIAM REYNOLDS, Commission Meat Salesman, Melbourne.—The site of the City

Abattoirs is unsuitable, being too low, so that there is not adequate drainage, and the accommodation paddocks are frequently flooded; besides, there is loss in the carriage of the meat up hill. Owing to their low-lying position, the abattoirs possibly did not receive the benefit of currents of air which they might do on higher ground. Architecturally, the buildings are sufficiently ventilated, but the hanging rooms are often overcrowded, to the injury of the meat. He has seen the burial of blood and offal in trenches already full of water; and in wet weather, with a high tide, these trenches must of necessity be full of water. The noxious smell sometimes perceptible on the race-course and in the valley of the Saltwater River comes from the noxious trades, and not from the abattoirs, but it is true that stock are killed and carcasses hung in an impure atmosphere. The noxious trades deal with refuse from the abattoirs, hence their presence in the locality as adjuncts to the abattoirs. A number of carcasses of tuberculous animals pass into consumption, but there is not the amount of diseased meat that is sometimes suggested. A Government veterinarian might be appointed, to be called in by the inspector in doubtful cases. The largest supply of beef comes from the Murray district and Riverina, including the Mitta Mitta districts and southern portions of New South Wales. Some, but not very much, also comes from Gippsland. At certain periods large quantities come from Queensland. Riverina is also the chief source of the supply of sheep. Cattle from Riverina are driven in mobs to Wodonga, trucked to Melbourne, and untrucked at Newmarket, usually during the evening. They are driven during the night to the cattle-yards, and sold the next day. Then they are killed at the abattoirs at varying intervals of time. They may be killed at once, or they may remain in the accommodation paddocks at the abattoirs for ten days. Usually they remain five to seven days. The rest puts the cattle in better condition for killing. The cattle are often much injured in the trucks—bruised and horned, and their horns broken off. They are also knocked about in the yards. A great want at the City Abattoirs is protection for the cattle from the weather in the paddocks. It is not possible to properly feed cattle in the paddocks. Food is given, but half of it is trampled on, and cattle from stations would not eat out of racks. They have to stand in water at times, and cannot lie down. The result is that the cattle deteriorate in quality, and lose

Unsuitability of abattoirs site, 3866.

3874.

Treatment of offal, 3878.

Offensive smell in valley of Saltwater from noxious trades, 3881-88.

Atmosphere at abattoirs, 3886.

Inspection of meat, 3889-95.

Sources of meat supply, 3896-3900.

Course taken by cattle, 3901.

Treatment in accommodation paddocks at abattoirs, 3934-35.

Killing in country possible and advantageous, 3914-23, 3937 and 3938.

Central abattoirs also essential, 3914 and 3924. Present site could be made good, 3925.

Noxious trades should not be near abattoirs, 3936.

Number of stock yarded at Flemington, 4203. Slaughtering on pasture grounds, 4203-9, 4323.

Riverstone system, 4392.

Chilled meat trade, 4296-4312.

4326.

Cattle-yards and abattoirs at Flemington, 4203, 4251-4272.

Siding to yards required, 203.

Chief sources of meat supply, 4210-20.

Trucking arrangements satisfactory, 4221-27.

Driving cattle to yards, 4228.

Subsequent treatment of cattle after sale, 4231-50.

Odours arise in Saltwater valley from noxious trades, 4266-75.

Trucking of cattle, 4350-51.

Cattle require rest before killing, 4353.

Sale of hides, &c., 4434-38.

Suburban abattoirs could be retained, 4440-50. Siding at yards, 4452-53.

seven to ten per cent. in weight (3915). A system of killing in the country could be adopted, with the advantage that the meat would be more juicy and tender. It is easier to pack dead meat than live stock, and more can be carried, fourteen bodies being carried in a truck that would only carry ten head of cattle. There would be no practical difficulty in supplying Melbourne from abattoirs 30 miles away, provided the railways offered sufficient facilities. Cooling sheds would be required, and proper trucks. If these were afforded, meat could be slaughtered and cooled at Echuca and Wodonga. Up-country abattoirs should be carried out by private enterprise. Were up-country killing established, abattoirs of a certain size must be retained near the city to meet the requirements of the trade. The site of the present abattoirs could be so improved as to be satisfactory. The chief pollution of the river is from the noxious trades; but under any system there would probably always be some blood-stained water to be removed from the abattoirs. There is no immediate necessity for the noxious trades being close to the abattoirs, but, on the contrary, it is undesirable. The present arrangements for the carriage of meat from the abattoirs to the city are satisfactory.

EDWARD TRENCHARD, Stock and Station Agent.—Gave evidence as delegate from the stock and station agents of Melbourne, and put in a written statement on their behalf. During 1887, about 105,000 cattle, 8,600 calves, 1,250,000 sheep, and 230,000 lambs passed through the market yards at Flemington. Slaughtering up country on the pasture grounds is impracticable, as the seasons are so uncertain, and particular districts cannot keep up a regular and constant supply of fat stock. A very large number of slaughter-houses and freezing works would be required, and must be established either by the State or by a private company. The chief objection to the proposal is that at no place would there be a sufficient trade to justify the large expenditure for staff. A system like that of Mr. Richards at Riverstone cannot have much effect on the meat, because the stock killed at Riverstone could not be kept there for any length of time. Fifty thousand or 60,000 acres would be required to keep grass for the number of stock he slaughters. There is no doubt a trade in chilled meat could be established if proper conveniences were provided, but the trouble would be to dispose of the meat when it arrived in the city; and there are so many difficulties that it would not pay. Such a trade would be an advantage to the consumer. The present position of the abattoirs could not be excelled. It is necessary to have all killing conducted close to the market and city, to save carriage of the meat. It would not pay to convey it by rail, as short-distance freights are so high, and the handling would be damaging. The present abattoirs are isolated from population by the cattle-yards on the east, the race-course and show grounds on the north, and the West Melbourne Swamp on the south. The city corporation are going to improve the abattoirs, and, by the erection of desiccators, the whole of the offal will be turned to profit without any nuisance. The smells on the Saltwater River come not from the abattoirs, but from various noxious trades there. The establishment of a market at a greater distance from the city than the present site would create a monopoly for the wholesale butchers. Four-fifths of the stock sold comes by train; and, if a siding is constructed to the yards, it will save cutting up the roads of Flemington, and enable business to be carried on more satisfactorily. The sources of stock supply vary. In the past season the chief supply came from New South Wales. Last week 35,000 out of 40,000 sheep came across the Murray, and about 1,300 out of 2,300 cattle. In August and September the Victorian graziers are run out of stock. During the whole of last year about half the supply, probably, came from Queensland and New South Wales. The chief source of cattle in Victoria is from the north-east, Wodonga, and from Gippsland. Sheep come chiefly from the west and north-west districts. Most of the sheep from the western district are taken to Ballarat. There might be some slight improvements in the trucks, but, generally, the arrangements for trucking stock in Victoria are satisfactory. The present mode of driving cattle from Newmarket to the cattle-yards is not satisfactory, but the cattle are not greatly excited—they are driven by careful men. The bulk of the stock are transferred after sale to the accommodation paddocks at the abattoirs. There is no feed in these paddocks, and he has seen water lying on the low-lying part. Cattle fresh from the country will eat hay. There is an ill odour in the valley of the Saltwater River, but it arises from the noxious trades; and he would have these trades removed, and does not think removal to a distance from the abattoirs would inconvenience their working. He is not familiar with the abattoirs buildings, or the treatment of stock after sale.

HON. JOHN G. DOUGHARTY, M.L.C., Stock and Station Agent.—Confirmed the evidence of Mr. Trenchard. The trucking and carriage of stock could be much improved. Stock should be carried right through by a night express. In his own experience a large proportion of stock are injured in trucking, chiefly owing to frequent shunting. Cattle that die *en route* are removed before the trucks reach Melbourne. Cattle are not fit for slaughtering immediately after sale, but require a period of 24 hours' rest. More inspection is required at the accommodation paddocks, to see that the animals are properly fed and cared for. It would be an improvement to have a market solely for the sale of horns and hides and hoofs out of town, instead of sending them into warehouses. He sees no objection to retaining the present suburban abattoirs, provided they are properly supervised. If there were a siding at the present yards the animals could be sold by weight in the trucks, and then sent on to the suburban abattoirs by rail.

GEORGE HOWAT, Stock and Station Agent.—Concurs in evidence of Messrs. Trenchard and Dougharty. The abattoirs are admirably situated; the land could be raised, and the cattle could be killed on a raised platform, and the blood and offal run down shoots into desiccators. The floors and gratings could be washed, and the washings be taken out to the bay in a barge, and then there would be no smell and no pollution of the river. If meat were killed in the country it would cost more; there would be loss in transit, and it would be unsightly, because it would have to be chilled, and then when removed to a higher temperature it drips. The loss in transit would be in conveying the meat to butchers in distant suburbs, as Brighton, who only want a small quantity of meat, not enough for a truck load.

Abattoirs might be improved, 4461.

Objections to country killing, 4465-4479.

Increased cost in transit, 4470.

ARTHUR S. KING, Stock and Station Agent.—Concurs in evidence of Messrs. Trenchard, Dougharty, and Howat. The noxious trades should be removed from Melbourne; but does not think the smell from them is injurious to the meat at the abattoirs. Some twenty years ago an attempt was made to get cattle-yards and abattoirs on another site, and the country was examined for twenty miles round Melbourne, and a more suitable site could not be found than the present one. A market on each of the different lines of railway would be disadvantageous to stockowners, who like to come down and see the stock sold, and the prices at the different markets would vary; that is the objection to sending dead meat, the owner cannot be satisfied that he gets a proper price for his stock. The only satisfactory plan was to concentrate the sales in one yard. In Sydney they used to have different yards, but adopted the plan of one market. The attempt to send dead meat from Wangaratta and Gippsland was a failure. The difficult man to satisfy is the one with a small number of stock. There would be great difficulties in obtaining labour for up-country abattoirs.

4568.

Removal of noxious trades, 4510.

Attempt to find another site for cattle-yards, 4520-4522.

Separate markets unsatisfactory, 4523-52.

Labour difficulty, 4553.

OCTAVIUS F. W. PALMER, Grazier.—Is trying to organize a business of slaughtering stock in the country, and intends to erect abattoirs in different parts of the colony; considerable progress has been made at Terang and at Wangaratta. The firm hope to conduct operations during the whole year, and will erect a dépôt near the railway for the disposal of the meat, and also a chill chamber. They will be guided by the supply of stock in different districts, and will move their men and appliances accordingly. The cattle will be rested before killing. Has had previous experience in the trade some years ago, and made inquiries as to the best method of killing cattle. They ought not to fast more than twelve (12) to twenty-four (24) hours before being killed; if they do they get feverish, and the quality of the meat is altered; it loses "sap," and is less palatable. The cattle should be driven in to slaughter quietly, as excitement also makes them feverish and alters the meat. The method of driving the cattle to the killing pens adopted in Melbourne and Sydney is wrong. He has a plan by which they can be easily and gently driven in. The Railways Commissioners are meeting them in every way, and have a suitable truck under construction. He is not sure whether it will be necessary to chill at the country abattoirs. For eight months of the year it will be possible to bring meat from the main centres without any artificial process. The extra number of dead carcasses that can be carried in a truck will compensate for the cost of carriage of salt, casks, &c., to the country, and the extra wages for labour, &c. The chief profit is expected to arise from the extra quality of the meat. The sellers of cattle are satisfied with his proposals, because the cattle get injured in trucking, and the loss falls on the producer. The losses from this cause are considerable to the settlers.

Will establish up-country killing, 5478-80.

5475.

Resting cattle before killing, 5483.

Exciting cattle by driving, 5494-95.

Railway facilities, 5483 and 5502.

5509-10 and 5540.

Extra quality of the meat 5512.

Producers approve of his system, 5526.

Losses in trucking, 5526-27.

THOMAS McLEOD PALMER, Grazier.—Has been extensively engaged in boiling down for the last twenty (20) years. He employs a large number of men, who live within half-a-mile of the boiling-down and bone-crushing establishment, and his own residence is also within half-a-mile. The effluvium from the establishment is often unpleasant, but has never been injurious to health. The manager of the works has reared a family of seven unusually strong children within 50 yards. He boiled down in closed vats, and blew off steam into the open air. The "soup" from the vats was put on the land. The establishment is in the country, and the carcasses boiled down were generally fresh. He concurred in the evidence on country killing given by his brother, Octavius F. W. Palmer. With regard to the expense of salting hides in the country, the hides could be sent to town without salting. He was the first to start country killing, ten years ago, in Gippsland, and had not been bringing meat into Melbourne six weeks before it was sought after on account of its superiority; but the wholesale butchers opposed him, and undersold his meat. Pigs might be fed on blood while growing, but ought to be fattened on grain.

Experience of effect of boiling-down works on health, 5546-47.

5537.

5563.

5550.

5579.

Previous experience of country killing, 5577.

Feeding pigs on blood.

RICHARD SPEIGHT, Chairman of Railways Commissioners.—The quantity of dead meat carried to London, compared with the live stock sent to be slaughtered there, would be between one-third and one-fourth. The prime cuts only of meat killed in the country districts is sent to London, the local people consuming the inferior meat. The proportion of dead meat carried is a growing quantity. The inferior London butchers are dependent on local killing. The freights on the Victorian Railways for live stock are 9d. per truck per mile up to 100 miles, above 100 miles and up to 150 miles 3d. per truck per mile, and above 150 miles an all-round rate of 7d. per mile per truck. No rebates are made for fat stock, but one-third is taken off store stock being carried to the farms, and on off days a rebate of 20 per cent. is allowed. The

London meat trade, 6186-88.

6258.

6259.

Freights, 6189.

Live stock.

Dead meat, 6191.

Speed of meat trains,
6249-51.

Quantity of dead meat to
a truck, 6253 and 6219.

No difficulties to country
slaughtering in transit of
meat, 6253.

Rate of stock trains,
6260-2 and 6211.

Injuries to stock in
transit, 6203.

Siding at Newmarket,
6217.

Removal of abattoirs and
a suitable site, 6237-39.

rates for the carriage of dead meat are 5d. per ton per mile, but practically no dead meat is carried. If a trade begins the Commissioners will have no hesitation in fixing a rate to meet the necessities of the case, and to fix a rate in some relation to that charged for live stock. The trains with dead meat will have to be run very quickly, and he would not undertake to carry dead meat at the same rate as live stock; a business in dead meat could not be profitably done at the present rates. More dead meat than live can be put into a truck, so that the sender of dead meat can afford to pay more. A truck holding ten head of cattle would carry about fourteen carcasses. As far as the establishment of up-country slaughtering is concerned, there is no difficulty in the railway transit part of the question, and the Railways Commissioners will afford every facility in the matter of rates, and convenient cars, and proper storage rooms at the terminus, in order to encourage the trade. The average rate of stock trains is twenty miles an hour, including stoppages; and the rate could be safely increased. Few stock are removed dead from the trucks at intermediate stations; the casualties are very small, many of them are the result of the fatigue the animals undergo before they reach the railways. The amount of shunting is at a minimum. The regulations as to tight coupling of stock trains are observed. A siding could be made to the Newmarket yards, it would cost £10,000; but now there is only a road between the present siding and the yards. He could find a site for abattoirs not low lying, favorable for drainage, away from habitations, with room for extension, and suitable from a railway stand-point for the concentration of the live stock trade.

Description of system of
treating night-soil and
house refuse, 131-151.

Collection, 142-144.

Treatment, 144-151.

Works are in the city,
154-161.

Town refuse, 163-168.

Cost, 203-205, 168, 213-215.

Machines can be used for
offal, 152 and 231-242.

Treatment of sewage at
Birmingham, 178-184
and 220-3.

SIR JAMES FARMER, senior partner of firm of Sir James Farmer and Sons, Adelphi Iron Works, Salford, Manchester.—Described the machinery patented by his firm for dealing with the excreta and all the refuse in connexion with towns, except the sewage water; some urine is dealt with, the material treated containing 93 per cent. of moisture. The machinery also deals with blood and offal from abattoirs. The excreta and the town refuse are kept separate, the latter being used for fuel. The houses are supplied with pans. When removed a lid is put on hermetically sealing the pan, and a clean pan is left in its place. The closed full pans are removed to the works. The contents are emptied into an iron receiving tank, provided with an in-draught, the out-draught being to the chimney, up which any foul gases discharge, but are not burnt. The material passes next to the storage tank, where it is treated with sulphuric acid to fix the ammonia, and it is heated to 150° F. Thence the material passes into the evaporating and pulverizing machines, from which it is discharged as a dry powder. The works at Birmingham are in the town, surrounded by houses within 25 yards. The inhabitants do not now make any objection to the works. The town refuse is collected and burnt, and furnishes the heat for working the machine and evaporating the excreta, and no other fuel is required. A large amount of clinker is formed, but does not increase the expense by destroying the fire bars. The machine was patented four and a half years ago; it is in use at Birmingham only. Nine machines suffice for nearly 400,000 inhabitants. The effluvium from the process is destroyed by heat. The vapours are condensed, and the condensed water is used for boiler purposes. He could not give an estimate of the cost of working the machines; the product, when sold, enables a profit to be realized; the product realizes £4 to £4 10s. per ton, and is freely used by farmers. Each machine costs £1,500. One of the machines is in operation at the Sydney Meat Preserving Company's Works for treating blood, offal, and all the refuse except the fat and the paunches of the oxen. It is cheaper to treat slaughter-house stuff than sewage. The slop-water and manufacturing and street drainage of Birmingham are precipitated by the lime process, and the effluent goes to the river; the sludge is furrowed into land on a farm of 1,200 acres. The use of his machines would not obviate the necessity of having a system of drains for the sewage apart from solid excrement.

Business of company, 2463. ALBAN GEE, Manager Sydney Meat Preserving Company.—Over 224,000 sheep and 6,000 head of cattle were killed at the works last year. Until four years ago blood and offal were buried in the ground; then, to prevent complaints, they were desiccated in a Farmer's machine, modified by enlarging the opening at the top (to admit large bones and solid matter), and by omitting the receiving and storing tanks. The blood is collected, without mixing with water, in a tank standing on a truck on a tramway, and taken to the machine, into which it is poured along a special shoot. The offal and all the refuse from the tallow vats is treated in the machine, mixed with the blood, and the whole is converted into manure in about twelve hours. The product is stored in a shed, then ground in a bone-mill, bagged, and shipped. He can sell all he can make at £5 5s. per ton in Sydney. The contents of the paunches are not put in; they are inoffensive. The steam from the cylinder is condensed, and then passes into the creek. The fluid discharged has a slight but not offensive odour. The gases given off, which will not condense, are conveyed to the combustion chamber of the boiler. He thinks Farmer's machine is the finest in the world for the purpose, and he is certain he would not be allowed to carry on this business without it. The cattle are shot in the forehead, hauled up by one leg, and bled by cutting the throat, then swung out of the killing-shed on to the flaying compartment at a lower level. The floor of the killing-shed is flagged and sloped steeply to a central drain, which conveys the blood to the receivers outside. Sheep are killed by cutting their throats over wooden gratings, under which a shoot conveys the blood to the receivers. The floors are not washed, simply swept and scraped.

Treatment of blood and
offal by Farmer's Desic-
cator, 2464-66.

2096.

Method of slaughtering,
2497-2501.

Method of cleaning floors,
2499-2502.

- JOSEPH JAGER**, Superintendent and Inspector of Glebe Island Abattoirs.—All the animals that come to the abattoirs are inspected by the assistant inspector, and any presenting appearances of disease are detained. If the owner is dissatisfied he can demand the presence of the Government veterinarian. The animal is then killed in presence of the inspectors and examined. There is also a general inspection of the carcasses every day; the spleens are also collected and hung up for inspection, with the view of more easily detecting anthrax. After the animals bleed the floors are washed down, and the washings pass into the main drain of the abattoirs. There is a reservoir at the end of the drain which used to be offensive; chlorido of lime was used to prevent the offence, but was found to be too evanescent. Cattanaach's deodorant is now being used effectively. He has tested this deodorant on blood and refuse in an open punt kept there for six days, and he could not detect any odour of decomposition. It would be an advantage if slaughtered animals were hung up and bled into a vessel placed under the animal, or into a water-tight trolley running in a subway. The animal would bleed better, all the blood would be saved, and it would be cleaner. Inspection, 2720-43.
- WILLIAM JAMES ROSER**, Manager of the Desiccating Works at Glebe Island.—If the Government got the full market value of the product of the desiccator, the machine would pay for itself. Some time ago there was an offensive smell from the process of cooking the offal in the machines; but there is none now that a condenser has been erected. There is no smell from the digesters, they are steam-tight, and are cooled down before the soup is drawn off. The soup is taken by a punt out to sea. The cylinders take two and a half to three hours to cook a charge. The waste from the condensers is discharged, without treatment, into the harbour, a foot under dead low water. The expenses in 1887 were £3,942, with £468 for the punt service. The receipts £3,968; but the Government did not receive that amount. He has tried the Cattanaach deodorizer on pig hair and pig offal, and found it had no effect whatever. Cleansing of abattoirs, 2744.
Use of Cattanaach's deodorant, 2746-51.
Collection of blood from animals, 2761-75.
Result of the desiccator, 2781.
Nuisances connected with it, 2782-84.
Expenses and receipts for 1887, 2814-15.
Cattanaach deodorizer, 2817.
- HON. JAMES SERVICE, M.L.C.**—When visiting Munich he had seen the abattoirs there, and been much impressed with their arrangements and cleanliness. The floors, pitched, as far as he could remember, were so planned as to prevent retention of offensive matter; the drainage was perfect, and there was no odour perceptible in the surrounding atmosphere. The cattle came by train to a siding, and the station was admirably arranged. At Berlin he purposely inspected the abattoirs. They are situated about three miles from the middle of Berlin, in open country. The arrangements there were as admirable as at Munich, and in addition an attempt at ornamentation is made by training flowering creepers up the inside walls. The whole place was pleasing to the eye. These German abattoirs were a great contrast to the slaughter-houses at Chicago, which he had visited some few months before. There the approaches to the buildings were of a most filthy character, and the cattle yards were unsatisfactory—not covered from the weather and untidy; and as a result of what was seen the general opinion was that the party would not eat tinned meat again. The buildings were about three miles from the city. The result of what he saw at Munich and Berlin was that it was quite possible to have slaughtering conducted in the immediate vicinity of a large population, in a manner that is not offensive to any one. It is a monstrous proposition to remove the abattoirs to Echuca. They need not cause a nuisance at all, and it is most desirable that they should be within a reasonable distance of the city. He strongly recommends that a special Commissioner be sent to inspect and report on the abattoirs in Germany. Abattoirs at Munich and Berlin, 4174-84.
Clean and well arranged: no nuisance.
Cattle brought by train, 4182.
Chicago slaughter-houses, 4185-92.
4192.
Abattoirs can be near a city, 4198.
Recommends the obtaining of a report on German abattoirs, 4198.
- JOSEPH COHN**, Veterinary Surgeon.—There is one abattoir for the whole of Copenhagen, situated about half a mile from the centre of the city, and with houses close to it. It is opposite the railway station, and the buildings abut immediately on the sea. The floors are of brick, with open drains. All the blood and offal are deposited in the sea. There is no smell whatever and no nuisance. Description of Copenhagen abattoirs, 5202-27.
- JAMES RICHARDSON WILLING**, Member of Legislature, Baltimore, U.S.A.—In 1884 a law was passed in Baltimore that all meat should be killed within five miles of the city, because the meat of cattle that were slaughtered before they came to the city was very inferior. The good meat in New York is slaughtered in New York, and is shipped there alive. The good butchers, who serve the best people, buy the cattle alive, put them on their own farms, and bring them in for slaughter as they are required. In Portland, Oregon, the butchers buy the cattle alive, and put them on their own farms. They ship the best to New York, and kill the poorest for local consumption. The city of Baltimore is five miles square; all the cattle have to be sent to one general abattoir. They are inspected by a live-stock inspector, and then by a dead-meat inspector, who, if he thinks the meat unfit for food, pours kerosene over it. Meat ought to be inspected alive. The inspector who sees cattle alive is much more competent to judge of the fitness of the meat than when the meat is killed. The inspectors are appointed by Government. Meat trade in Baltimore, 5363.
Meat of New York, 5382.
Meat trade in Portland, 5384.
One abattoir only in Baltimore, 5387 and 5397.
Inspectors, 5387 and 5403.
How appointed, 5389.
- WILLIAM JOHN RITCHIE SIMPSON, M.D.**, Health Officer of Calcutta.—There is one abattoir for Calcutta, situated about three miles from the town boundary. To this abattoir all the stock are taken alive, and there slaughtered under the supervision of the superintendent and his assistant, who also inspect the animals cursorily before slaughter, and the carcasses after slaughter. Meat condemned by the inspector is seized and destroyed; the rest is marked as different classes of meat. The superintendent is appointed by the city council, and the establishment is a municipal one, Calcutta abattoirs, 5605.
Inspection, 5610-11.
Establishment a municipal one, 5614.

| | |
|---|--|
| Construction and site, 5613. | erected by the municipality. It is built very thoroughly on an alluvial soil, away from houses, with plenty of room, and well ventilated and drained. The floors are well paved, and the drainage runs at about ten feet from the building into a large sewer, which carries it away to a creek, and it finally reaches the sea. All the blood runs into the drains; the offal is taken three miles away in trucks by a railway and boiled down. The meat is taken to the metropolitan market and sold, the different classes of meat being kept, as far as possible, apart. |
| Drainage, 5613. | |
| Refuse, 5613. | |
| Market, 5606-7. | |
| Abattoirs can be near population, 6268. | JOSEPH MILLER , Commission Agent.—Has used refuse of slaughter-house for manure, and has seen slaughter-houses in close proximity to dwellings without any offence, because kept scrupulously clean, well drained and paved, and well ventilated. He possesses plans for a furnace for boiling down that consumes its own smoke and offensive odours. |
| Furnace for boiling down without offence, 6268-71. | |
| Extent of business, 4926-27. | SAMUEL KNIGHT GRIMES , Bacon-curer.—Has an extensive business, the annual output being close on £18,000. The floors of the pig-pens are made perfectly watertight; they are concrete underneath, then there is a thin layer of cement, and on this the bricks are laid, and grouted in with cement. The floor is so sloped that all fluid runs quickly off, and the drainage passes into catch-pits, where it is treated with lime and charcoal. The fluid is syphoned from one pit to the other, and the effluent is pure water. The cement grouting of the floors does not come out when properly put in. The walls of the pen are brick, cemented; the roof of iron, and louvered. The floor of the killing-pen is pitched and grouted in cement. The blood is buried in the ground 2 feet to 2 feet 6 inches deep, with plenty of lime. The offal is burnt in the furnace, and there is no nuisance. Formerly the offal was boiled down, but it created a nuisance. His establishment is about two miles as the crow flies from Footscray, and he often gets the smell of boiling-down from there. The carcasses are brought to a temperature of 34° F. to 36° F. in the freezing room, but are not frozen. Pigs ought not to be kept at abattoirs, or fed on blood or offal; such pigs do not make good bacon; it has not a good color, and will not keep. He could not say that slaughterhouse-fed pork is unhealthy, but it is inferior to corn-fed. It would be impossible for bacon-curers to carry on their business if they were compelled to slaughter at abattoirs. Pork quickly absorbs surrounding smells, and if it does will not cure; the premises have to be kept exceptionally clean and free from smells. |
| Character of pig-pens, 4928-32. | |
| Drainage, 4928, 4952. | |
| Stability of cement grouting, 4935-38. | |
| Killing-pen, 4933. | |
| Treatment of offal, 4943. | |
| Chilling, 4948-4951. | |
| Keeping of pigs at abattoirs, 4953-62. | |
| Killing pigs at abattoirs, 4963. | |
| Site and nature of business, 4953-981. | ARTHUR WILLIAM FITTS , Manure, Glue, and Tallow Manufacturer.—Has been in the business all his life. His establishment is about a quarter of a mile from the City Abattoirs, and is freehold. He removes the heads and feet from the abattoirs with his own drays, about 6 a.m. daily. He extracts tallow from the heads, oil from the feet, and glue from the hides. It would not pay him to carry on his business there if the abattoirs were removed. He also gets the fleshings and trimmings from the tanneries. All the raw material is treated with lime, it is then steamed in open vats, run off into coolers to solidify, then cut up into cakes and hung on frames to dry. The only smell is during the boiling, which must be done in open vats, so that it may be watched. Does not think it could be done in Lugton's boiler. The smell is not offensive to him. Part of the refuse of the fleshings is ground into manure; such parts as would smell more are used as fuel. The drainage of his establishment is bad, but could be improved. All the drainage and the washings go into a receiving vat, and is treated with lime. All the solids are precipitated; the effluent goes to the river. This vat is cleared out every day, and the contents added to the manure. No refuse is sold; everything is manufactured into manure. The solid refuse from the boiling-down vats is treated with sulphate of soda and dried, and thus offence is prevented. He pays a registration-fee to the Flemington Council annually. The Council sends an inspector sometimes, who has found fault with the drainage; and he received an order to attend to the drains. He had the floor asphalted in consequence. The order was sent owing to the action of the Central Board of Health. The drainage could be improved if the floor was raised. The drainage could be made efficient, and pollution of river prevented, and the business conducted without any offence to the public, by using proper appliances; and he would guarantee to expend the necessary money if he had a secure tenure, and was not likely to be interfered with. If he had a secure tenure he would be willing to take his license subject to the condition that there would be no offence to the public outside. He believes others in the trade would be willing to guarantee that there would be no offence, if they had secure tenure. Does not know a more suitable place to which his and similar trades could be removed. If they were removed, the stuff that they collected from the tanneries would accumulate, and might become a local nuisance; it would not pay to carry it far. He and his workmen are always healthy. |
| Drainage, 986 and 992, 1006-1010. | |
| Treatment of refuse, 993-996. | |
| Registration and inspection, 991, 992, 997-1005, 1011-1020. | |
| Business need not be offensive, 1017-1019, 1029-1038. | |
| Removal of business to other sites, 1025-1028. | |
| Effect on health, 1036. | |
| Nature of his business, 883-922. | RANDELL W. WADDELL , proprietor of a boiling-down establishment, and maker of tallow oil and bone-dust, on the Saltwater River.—His property is freehold (Q. 878.) No complaint has been made about his establishment. Fat, heads, feet, and bones are collected in carts from the abattoirs and butchers, placed in digesters, and subjected to a pressure of steam, 40 lbs. to the square inch, for four to five hours. The product is run into coolers; the tallow floats on the top and is skimmed off, the gelatine and other matters sink to the bottom, are extracted by a patent process, and then added to the bones to make manure. The steam-pipe from the vats passes |

under the furnace, and when steam is blown off, it blows through the furnace, and thus offensive smell is entirely destroyed. The vats are cooled down before they are opened to draw out the bones and refuse, and then there is no smell. The smell is caused by blowing off the steam or opening the vats too soon. The refuse from the pressure-vats is put in a shed to dry, the drying taking about a week. There is no smell from this ; and he has never used any lime or disinfectant. The fat is boiled in open vats, but covers will be made, on the suggestion of the Health Officer. The drainage is carried by large underground pipes to the river. There need not be a smell from boiling-down establishments if they are properly conducted : smell occurs if the vats are opened too soon, or if the steam is allowed to escape. Witness has been over six years at his present site, which was chosen because it was convenient, having a river frontage and being near the abattoirs. The removal of the abattoirs would be a very great injury to the business, and would practically prevent its being carried on there, owing to the increased cost of the carriage of the raw material. The fat received from the butchers is sometimes offensive in the summer time.

Prevention of smell, 892.
Cause of smell, 931-938.
Drainage, 923.
Need be no offence, 928-941.
Effect of removal of abattoirs, 942-947.
950.

ROBERT HESLEDEN BINNEY, of the firm of Blyth, Irvine, and Binney, bone-millers and manure merchants.—The firm receives annually about 6000 tons of raw material—sheeps' heads and trotters from the fellmongers, green bones and beef and mutton and fat from the butchers' shops, dry bones from the marine stores, "bone meat" or the refuse from vats of the people who have no bone-mills, but simply boil down. The material is put into vats as soon as received ; the blow-pipes from the vats discharge under the furnace. The refuse from the vats dries of itself, and is placed in heaps on a floor of kauri pine. He has tried various artificial methods of drying the refuse, but without success. The drying process is the chief source of nuisance ; it might be hastened by spreading the refuse thinly over a grating, with an artificial current of air under or over it. The waste liquors are partly evaporated, partly go to the river. The waste consists of gelatine ; there is no sediment in the drainage. The amount of the product on the premises depends on the demand for it. One reason for keeping so much material on hand is, that the Act compels storekeepers who keep bone-dust to pay a license of £5 a year ; and now they do not keep it. If removed further from town the cost of the manure would be increased. If removed, say to Braybrook, on a railway siding, there would have to be a depôt in Melbourne to receive the material.

Sources of raw material, 43 64-68.
Mode of treatment, 4872.
Drying of refuse chief nuisance, 4884.
Drainage, 4892 and 4896-7 4888.
Removal of business, 4916-23.

FRANCIS WILLIAM DONOVAN, Currier.—Gave evidence as representative of the Amalgamated Tanners' and Curriers' Union of Victoria. About two months previously the Union had waited upon the Chief Secretary to urge the reasonableness of excluding the trade of tanning and currying from the noxious trade list in the Amended Health Act of 1883 ; and the Chief Secretary referred them to the Sanitary Commission. It is the first time the trade has been designated a noxious trade, and the provisions of the Act are injurious to the trade ; it prevents the extension of business by the action of clause 91. The refuse discharged from a tannery is not offensive ; any offence is counteracted by the lime used. Fowl dung bate is still used in tanneries near Melbourne ; there is a new bate invented that is inoffensive, and better than fowl dung. Fowl dung bate is offensive, but is only used one bag at a time. Is not aware that fleshings are kept to dry in some of the tanneries. The powers vested in inspectors of nuisances ought to be ample to keep tanneries in order and free from nuisance.

Desire to have trade of tanning removed from list of noxious trades, 5067.
Offence from tanneries, 5076.
Bates, 5076-80.
Treatment of fleshings, 5081-84, 5091.

BENJAMIN HOLTON, Currier.—Corroborated the evidence of F. W. Donovan. Is familiar with tanneries in England ; all are in the centre of population, and cause no nuisance.

5094.

SQUIRE KENNON, Tanner.—Corroborated the evidence of F. W. Donovan and B. Holton. Knows of instances in which permission to erect new tanneries has been refused.

5100-5111.

THOMAS DUNN, Tanner.—Corroborated the evidence of F. W. Donovan, B. Holton, and S. Kennon. There are only eight (8) small tanneries in Melbourne ; all the others are large businesses, and have arrangements for filtering the waste liquors and disinfecting them so as to prevent a nuisance.

5116-19.

WILLIAM HENRY HUSBAND, Solicitor.—Resides at 24 Darling-street, South Yarra, about 300 or 400 yards as the crow flies from the fellmongeries on the Yarra ; and appears on behalf of certain residents of South Yarra who have signed a memorial, bringing under the notice of the Commission the nuisance caused by the smell from the fellmongeries on the Yarra banks. The smell compels the residents to keep their doors and windows closed ; and the river is polluted by the discharging into it of the refuse from these establishments. The carting of pelts through the streets, with decomposing heads attached, is also a nuisance. Three several attempts have been made during the last three years to get the local board of health to abate the nuisance, but without success. The inspector of the local board stated that the smells were not injurious to health. The properties of these fellmongeries have been enormously enhanced in value by residences being built near them ; and the increased value ought to be sufficient compensation for them.

Residence, 5299 and 5312.
Put in a memorial re fellmongeries on Yarra, 5302.
Offensive smell, 5303.
Pollution of Yarra, 5305.
Carting of pelts, 5304.
Attempts to abate nuisance, 5317-20.
Compensation, 5321.

CHARLES BAGE, Doctor of Medicine.—Resides at Toorak-road, South Yarra, and signed the memorial to the Commission. Is satisfied that the smell from the fellmongeries is injurious to health. It made him sick one day in April 1886 ; and he, with two

Residence, 5323.
Fellmongeries injurious to health, 5328-9.

Proceedings by local board
5329-40.

5357.

Fellmongery on Yarra,
6015-23.

Inaction of local board in
removing nuisances,
5746-47.

Action of Central Board,
5748-50, 5752.

Remedy proposed, 5757.

Boiling-down licenses,
3295.

Slaughtering on butchers'
premises, 3296-7.

Deputation re noxious
trades, 6273-74.

Bone mills and slaughter-
houses a nuisance at
Footscray, 6279-81.

Supervision of noxious
trades, 6285.

Proceedings by Local
Board, 6286.

Pollution of River Act,
6286.

Cost of legal proceedings
prohibitive, 6297-6300.

The trades could be made
less offensive, 6301.

Pollution of river by
slaughter-houses, 6315,
6318 and 6319, 6350-51.

Abattoirs should be
removed, 6310.

Difficulty in removing
them, 6311-14.

Special legislation
required, 6316.

Compensation, 6325, 6328,
6330-6337.

Question is a public one,
6333 and 6340.

Trades not licensed, 6345
and 48.

Strong wish for their
removal, 6329.

Point Cook suggested as a
suitable site for noxious
trades, 6303-04.

Duties of Inspector,
6356-58.

Offence from noxious
trades at Footscray, 6439.
Nature of trades, 6446.
Smelting works, 6447-52.

other medical men and about thirty ratepayers, complained by letter to the local board of health, and, in consequence, proceedings were taken. The case was postponed for a month to allow of certain instructions of the city health officer, as to disinfectants, to be carried out. The case did not come on again although the nuisance was not abated. No further prosecution has been undertaken. Is not aware of the state of the law on the subject. The nuisance is not constant. The drainage of the fellmongeries all goes into the Yarra.

ROBERT ROBERTSON, Inspector of Nuisances, Prahran.—There have not been any complaints for the last nine months about the fellmongery on the Yarra. It is generally kept clean, but there is an offensive smell there. There have been complaints, and a prosecution was instituted, and the occupiers promised to abate the nuisance. Such trades are a nuisance, and should not be so near population.

WILLIAM JAMES KEEBLE, Builder.—Some years ago complained to the local board of health concerning the nuisances that arose from an abattoir and boiling-down establishment near his residence at Clifton Hill. As no result followed his appeals to the local board, he appealed to the Minister of Lands, and thus got the abattoirs removed. The boiling-down remained however; and, up to the present time, there is no diminution in the smell therefrom, notwithstanding repeated complaints to the local board. Appeal was also made to the Central Board of Health on more than one occasion; and once a prosecution was instituted under the 93rd section of the Health Act, with the result that a fine was inflicted; but there was no cessation of the nuisance. The proprietor is willing to move, but the local authorities will not compensate him. The Central Board refers the matter to the local board, and it declines to take action. He would remove all health matters entirely from the control of the local councils, and place them under a central authority. The present powers are not used.

CHARLES JAMES EASSIE, Sanitary Inspector for Fitzroy.—Licenses for boiling-down should not be issued to butchers, as small butchers cannot boil down without creating a nuisance. There is a good deal of slaughtering done illegally on butchers' premises, owing to a defect in section 129 of the Health Act, where the word "keep" is not defined.

FREDERICK JAMES GOMM, Town Clerk of Footscray.—At the beginning of the year 1887, the town of Footscray was represented in a deputation to the Premier with regard to the removal of the noxious trades from Footscray. The chief objection is to the bone mills and slaughter-houses, as these are a great nuisance. They pollute the Saltwater River; and, whenever the wind blows from the north, north-east, or east, it is impossible for the residents to keep their doors and windows open. The presence of the trades is detrimental to the progress of the town. The offensive condition of the bone mills could be mitigated by more stringent supervision. The local Board of Health have instituted proceedings against the proprietors, and have obtained convictions; but such proceedings are very expensive. It is difficult to prevent the pollution of the Saltwater River, as the Yarra Pollution Act does not protect the tributaries. The Council is framing a by-law to prevent the pollution of the Saltwater River within the boundaries of the town. The Council has spent much money in proceedings against the proprietors of the bone mills, and the cost has deterred the Council from instituting further proceedings. It transpired during these proceedings that, by the erection of certain machinery, the establishments could be rendered almost innocuous. The private slaughter-houses pollute the river by running blood and offal into it. The drains from these slaughter-houses are supposed to have catches to stop the flow into the river, but when no one is about these are raised, and all the refuse is swept into the river. These private slaughter-houses ought not to be retained, but they are on private property, and the local board has no power to refuse to license them unless something could be shown against the character of the licensee. Proceedings have several times been taken against one of the licensees, but he has always gained the case by some legal quibble. The Town Council considers that some special legislation is required for their removal. If removed, compensation would be necessary; but the revenue of the borough would not permit of the Council paying such compensation, though it has authority to do so under the Municipal Act. The Town Council has done all it can to prevent the nuisance from these trades, and failed. The matter affects the public as well as Footscray, as the main lines of railway pass these trades. The noxious trades are not licensed—they merely pay registration fees. It would be a good thing if the Council had power to withhold a licence. There is a very strong feeling in Footscray against the continuance of these trades; but the Council has not considered where they should be removed to. A site was suggested near Point Cook, with a branch railway from the Geelong line. The Inspector of Nuisances acts under no specific directions other than the by-laws. He reports fortnightly, and, in a glaring case, at once, and gets instructions how to act. In certain cases he acts without special authority.

CHARLES LOUIS MCCARTHY, M.B., Ch.B., Health Officer of Footscray.—Is well acquainted with the various noxious trades in Footscray. They are all very offensive, but the principal nuisance is caused by the bone mills. The other trades are a gut factory, two slaughter-yards, a glue works, chemical works, and smelting works.

The last emit disagreeable sulphurous and pungent fumes, containing a small percentage of arsenic. Only Yan Yean water is used for drinking purposes. Apart from the smells, the trades are in a fair condition, but the site is unsuitable for such works, being low-lying. No noxious trades have been established while he has been Health Officer (three years); there has been constant opposition to the existence of the trades. Various devices have been employed from time to time to minimize the offence from the bone mills, but they have failed. The last and most signal failure was drawing the nitrogenous fumes through the furnace and up the stack, which is 75 feet high; so that now the effluvium is spread over about six (6) times the superficial area, and the smell is not destroyed. Nitrogenous fumes are not affected by fire; they would put the fire out. The proprietors have done all they could to diminish the smells, but there is no practical and economical means by which the smells of such establishments can be thoroughly obviated in this climate. The smell is due to boiling down rotten meat, a little of which produces considerable smell. This rotten meat is delivered in covered carts, and the Town Council has no means of preventing its importation; but this meat does not cause much offence in transit. The tanneries are fairly kept, and are not offensive, as the refuse is treated with lime; they may look untidy. The Saltwater River acts as a sewer for all these noxious trades; gallons of blood and tons of offal pass into and down the river, to be driven back by the tide on to the banks. The local board is preparing a by-law to check this pollution, but until this is passed the board has no authority to check it. The bone mills discharge gelatine into the river, and that is distinctly offensive. The local board cannot prevent that under the present Health Act; it has no control over the river. The gut factory also pollutes the river, and the tanneries slightly. The effect of these offensive trades on the residents is, that the weakly and convalescent do not get on well under treatment while within smell of the trades, and the children suffer in hot weather—lose appetite. There is no specific ailment as the result of the trades. The employes at such trades are not affected because they are exceptionally healthy men. Their families suffer; the system becomes weakened from inhaling the vitiated atmosphere. There have been no marked outbreaks of specific disease in Footscray, which stands a favorable comparison with other towns as regards zymotic disease. The infantile mortality is about 23–24 per cent. of all births, and this rate is connected with the nuisances from the trades, as the children are deprived of fresh air, because the doors and windows have to be kept shut to keep out the smell.

Drinking-water used, 6439-90.
Condition of the trades, 6453.
Site had, 6453.
Opposition to the trades, 6454-5.
Efforts to minimize the nuisances, 6441.

Effect of fire on fumes, 6445.

Offence cannot be removed, 6487.

Smell from rotten meat, 6487 and 6494-97.

Condition of tanneries, 6481-82.
Pollution of Saltwater River, 6465-6480.

Effect of these noxious trades on health, 6456-64.

No specific illness from trades, 6458.

Effect on employes at trades, 6459.

Prevalence of zymotic disease in Footscray, 6486, 6462-6463.

Infantile mortality in Footscray, 6433-5.

Offence from the bone-mills at Footscray, 6367

Cause of the offence, 6368

Time it occurs, 6370.

Nature of offence, 6372-3

Impossible to avoid it, 6377.

General condition of establishments, 6381-3.

Pollution of river, 6424.

Condition of tanneries, 6339-91.

Removal of the trades, 6392.

Introduction of the noxious trades to Footscray, 6399-6409.

No opposition to their coming, 6403.

Compensation, 6410-14
6416-20.

Flemington Canal a nuisance, 6424-27.
Desiccating works at City Abattoirs objectionable to Footscray, 6428-32.

Duties, 6059-65.

Power to summons, 6165.

Difficulties in administering Act, 33rd section, as to unwholesome food, 6066-63.

Dairies, 6069-73.

Cowsonswamp, 6173-6180.

Infectious diseases, 6079.

RICHARD W. KITCHEN, Estate Agent, and resident of Footscray.—Lives within half a mile of one bone mill and within a mile of others, and has experienced nuisance from the noxious trades, but especially these bone mills. The offence is most noticeable when they are taking the material out of the vats to put it on the floors. It is not noticeable every day, but generally two or three times a week, and especially in the middle of the night. The smell is sickening and unbearable at times, something like the effluvium from a night-cart. In his opinion no means can be adopted to prevent the production of these odours. They boil down rotten meat to extract the fat; and all the attempts made to minimize the offence have been complete failures. The establishments are kept clean; the refuse from the vats is spread out on the floors to dry, and that drying refuse causes the worst offence. The slaughter-yards pollute the river by allowing blood to run into it. The tanneries are unobjectionable, and are kept in fair condition. The noxious trades should be removed; if they were away the population of Footscray would be doubled, and the price of land trebled. The ground near these trades has never been built on. The trades came to Footscray ten or eleven years ago; and no organized opposition was raised by the inhabitants. When they came they said they had appliances which would minimize the offence, and, on those terms, no opposition was made; the majority of the Town Council encouraged their coming. The land is the property of the proprietors of these trades, and has increased in value from £800 per acre, which they paid for it, to £2,000 per acre; and hence very little compensation should be given. The Government ought to pay the compensation because their removal is for the benefit of the whole country. The cut canal from North Melbourne causes considerable nuisance at Footscray, where it discharges into the river. The chimney for the desiccator at the City Abattoirs is not high enough; it is not as high as Footscray; and the fumes from it will be smelt at Footscray.

JOHN FULLERTON, Inspector of Nuisances of the City of Melbourne.—Has no other office, and has two assistants. The city is divided into six (6) parts for cleansing night pans, each morning the contractor reports on neglected places and these are inspected. In addition, all parts of the city are systematically inspected from yard to yard to see that they are clean, that there is no defective drainage, and so on; has no special instructions beyond the Health Act and the city by-laws. In cases of ordinary nuisances he takes out summonses himself. With regard to prosecutions for unwholesome food, difficulty has arisen from the law not defining who is the responsible party, the owner or a servant who sells the article; it ought to be the owner. No difficulty from the presence of the word "knowingly" in the sections. The dairies in the city are in a fair condition; they are registered. There is very little milk kept on the premises, but in all city dairies there ought to be dairy rooms for the storage of milk. A few cows are fed on West Melbourne Swamp; such cows often have dirty udders. Finds no difficulty in getting people to obey instructions as to disinfectants, &c., in cases of infectious disease. The system adopted for the

Nuisances, 6096-98.

Treatment of nightsoil,
6100-6135.
Hours for removal, 6105.

Mode of removal, 6109.

Destination, 6114.
Checks, 6115.
6118-19.

No disinfectants, 6124.
Street drainage, 6137-44.

Cellars, 6145-50.

Outlets of drains, 6151-59.
Subsoil, 6160.

Duties, 3289.

Difficulties in carrying out
duties, 3290; and defects
in Health Act, 3294.

Boiling-down licenses,
3295.

Slaughtering on premises,
3296-7.

Dues for making rights-of-
way, 3298.
Cow-keeping in the city,
3299.

Dairies, 3313.
Paving of yards, 3311-7.
Not enough inspectors,
3308-10.
Lodging-houses, 3314.

Drainage, 3329-50.

Stables, 3370-71.

Cleansing of streets, 3361.
House refuse, 3362.

Tips, 3367.

Night-soil, 3351-57.

Mode of removal and
treatment, 3395-3408.

disinfection of closets in houses where typhoid fever has occurred is fairly satisfactory, and is carried out. Has no difficulty in carrying out laws relating to nuisances, nor in keeping yards clean. The Police Offences Statute deals with private yards more effectually than the Health Act. There is sufficient law to enable him to keep the yards clean. The single-pan system is used for night-soil, and all the pans are emptied once a week by the city contractor, without charge. Some are emptied twice or thrice a week, for which the proprietor pays extra. Emptying of the pans is allowed after 11 p.m., except in Carlton, also in a portion of West Melbourne, where it is permitted after 10 p.m. The contractors' carts must be out of the city by 3 a.m. As a rule, the nightman takes a pan of his own into the yard, and empties the householder's pan into his own, which he empties into the cart. There is no cleansing of the pans whatever. In the case of rights-of-way each householder's pan is emptied into the cart. It is possible in such cases that a pan from one house might be returned to another, but it would be exceptional. There is an offensive smell during the process. Believes the bulk of the night-soil of the city is deposited at Brighton and Caulfield. Each carter has a ticket which he takes to the farm where he delivers, and he gets a ticket back to say it is delivered there. The contractor checks the tickets because the farmer has to pay for each load. The Corporation has nothing to do with them. No disinfectants are used by the nightmen. There are no catchpits now in connexion with the drains. There are two or three places in Elizabeth-street and in Bourke-street where drains from rights-of-way pass under houses. The bad smell at the Town Hall corner is due to the escape of sewer gas through an opening there into the sewer. There is not much trouble now with wet cellars; most are asphalted, and drain into the sewer, and they are pumped dry and cleaned daily. The chief discharges of the drains into the Yarra are opposite King-street, Swanston-street, and Queen-street. The condition of the subsoil is much better than it used to be, since the cesspits were abolished; but it is hardly satisfactory even now.

CHARLES JAMES EASSIE, Sanitary Inspector for Fitzroy.—His duties are, firstly, carrying out the provisions of the Public Health Amendment Statute 1883, and such portions of other Health Acts as have not been repealed; secondly, the supervision of scavenging and the contracts for the city; thirdly, the supervision of the night-soil contract for the city; fourthly, the collection of all payment dues in the eastern portion of the city, under the 416th section of the Local Government Act; fifthly, the collection of all dues chargeable by the Local Board of Health for the construction of private lanes; sixthly, carrying out the provisions of the Dog Act 1884, and collecting the fees due thereunder; and, lastly, conducting all prosecutions under the Health Acts, the Local Government Act, the Police Offences Statute (Part 5), and the city by-laws. The salary is £200 per annum, with an assistant at £130 per annum, and a mileage allowance of £50 per annum. The only prosecutions obtainable in regard to adulteration of food are in the case of milk; the Act does not deal with other articles of food. There is a defect in part 4 of the Health Act (Infectious diseases)—there is no provision for dealing with the excreta of typhoid patients, which at present is treated like other night-soil. Licences for boiling-down should not be issued to butchers, as small butchers cannot boil down without creating a nuisance. There is a good deal of killing carried on in butchers' premises illegally, owing to section 129 being defective in regard to the word "keep," which is not defined. Dues for the making of rights-of-way should be made chargeable on the property. Cow-keeping should not be allowed in the suburbs. The cows are often crowded in close sheds, and fed on improper food, such as stale vegetables. The drainage from the cowsheds runs into the gutters. No licences should be issued to dairies until the inspector sends in a report that the premises are suitable. The absence of power to compel yards to be paved leads to nuisances. There are not enough inspectors for a periodical inspection of all premises to be made. Part 3 of 28 Vict., relating to common lodging-houses, at present optional, should be made compulsory. The drainage of Fitzroy discharges into the Yarra by the Reilly-street drain. A portion of the drain is unformed, and a sediment occurs in it which is very offensive. The drainage consists of household slops, urine, kitchen and bath water, washings of clothes, infected clothes included, and the washings of infants' napkins. In the poor parts of the city children's excreta is often found about the yards, and may get washed into the street channels. The drainage of stables also passes into the channels. There is not much nuisance from stables; the chief difficulty is in getting rid of the manure, which at present is taken to the Edinburgh Gardens. The main streets are horse swept every day; the channels of the smaller streets and rights-of-way are swept twice a week; and the boxes for household refuse are emptied twice a week, and the refuse trenched-in in the Edinburgh Gardens. There is not much offence from this now—there used to be. A portion of the old tip on Matthew Smith's swamp is now built over. There has not been a case of typhoid in any of the houses there for the last two years. No deodorant nor earth is used in the closet-pans. They are emptied once a week; no deodorants are used in the process, which is exceedingly offensive. The pans are simply emptied, not cleansed or disinfected in any way. As a rule the nightman empties the householder's pan into a special pan of his own, and when this is full he empties it into the cart. When the cart is full it starts out to its destination, and there it is thrown on ploughed land, and two or three times a year the ground is ploughed again. In some instances a bank is made, into which the stuff is tipped, to be used as required. At the Chinese gardens, at Preston, as many as forty loads are tipped into a large hole,

into which runs the waste water and urine, and the mixture is ladled on to the vegetables. The ploughing-in of the night-soil destroys the smell. He believes the night-soil of Fitzroy at the present time is put on a large dairy farm beyond Preston. If a case of typhoid fever is reported, he reports it to the health officer, and then proceeds himself to examine the house and the yard, and also a number of the adjoining premises. He reports the result of his examination to the secretary of the Local Board, who instructs him if further steps are necessary—such as repairs to drains or closets, and instructions about the use of disinfectants. He supplies disinfectants (carbolic acid) to people too poor to pay for them. In bad cases he uses corrosive sublimate himself. He has never received any instructions to see that the clothes of typhoid patients were placed in boiling water or some disinfecting fluid. It could be done if there were so many inspectors that an inspector could have time to personally see that it was done.

Proceedings in cases of typhoid fever, 3372-87.

Disinfectants, 3375.

ROBERT ROBERTSON, Inspector of Nuisances, Prahran.—Is also Inspector of Weights and Measures, and has a clerical assistant. Has no definite instructions beyond the by-laws. Has not found much difficulty in administering the portion of the Health Act relating to unwholesome food. Prosecutions in regard to adulterated milk and diseased meat have been very successful. By-laws have been adopted for the control of dairies; they are registered and inspected. As a rule there is no special room for the storage of the milk; in most cases the vendors of the milk are only tenants, and it would be difficult to enforce a provision for such a storage room. Has had no difficulty in getting proper disinfection, or destruction of infected clothing or furniture, in cases of infectious disease, or in making a satisfactory inspection of the premises in such cases. When notices are given under 136th section of the Health Act for removal of nuisances, and in case of dirty yards, they are generally complied with; if not, he prosecutes on his own authority. Closet-pans in the city are cleansed partly by public contract, partly by private contract; there is no special rate for it; it would be advisable to charge a rate, and to have it all done by the Corporation, and to use double pans. The present system is a nuisance. No notice is received from the nightmen as to where they are going to dispose of the night-soil. The contractor for Prahran has land at Brighton into which the night-soil is ploughed. Night-soil has lately been frequently tipped on the roads, and it is difficult to detect those who do this. It might possibly be prevented if the carts were locked up, and unlocked with a duplicate key at the dépôt, and a receipt for the load given there. Cow-keeping should not be allowed in the city. The drainage of the city discharges in two principal directions, first into the Yarra near the Railway Bridge, and second into the St. Kilda lagoon. A little drainage goes into Como Swamp, and the overflow from the swamp into the Yarra. The falls in the drains are good. The drainage consists of the water from baths, clothes-washing, bedroom water, &c. Where much new building is going on this drainage is not allowed to sink into the soil; the local board insists that properly formed channels are made to carry it away. In many cases drains pass under the floors of houses; it is the only outlet; in such cases iron pipes now are used. There is often water under the house floors, and the subsoil is very wet in many places. He inspects for such, and recommends proper remedies, draining the sub-soil with agricultural drain pipes connected to the sewers and properly trapped. The sewers are ventilated with gratings, not with shafts. A house in Toorak-road is built over a main sewer; there is no provision for preventing such an occurrence. There are now no cesspits in the city; in some cases the old cesspits caused great contamination of the subsoil; there is not much now. There have not been any complaints for the last nine months about the fellmongery on the Yarra; it is generally kept clean, but there is an offensive smell there. Complaints were made, a prosecution was instituted, and the occupiers promised to abate the nuisance. Such trades are a nuisance, and should not be so near population.

Duties, 5911

Unwholesome food, 5918-19, 5932-35.

Dairies, 5920-31.

Infectious diseases, 5936-39.

Nuisances, 5940-41.

Night-soil, 5942-5970

Cow-keeping in the city, 5970.

Drainage, 5972-6004.

In new localities, 5990.

Water under floors, and in subsoil, 5998-6000 and 6009-6011.

Cesspits, 6007.

Fellmongery on Yarra, 6013-25.

LEOPOLD HESSE, Chemist, and proprietor of Sanitary Works.—Is contractor for removal of a portion of the night-soil of St. Kilda. Each householder is supplied with a pan fitted with a movable lid, which, when fastened on, renders the pan airtight. When the pan is full the lid is applied and the pan removed to a waggon; a clean pan disinfected with carbolic acid is left in its place. A disinfectant, composed of crude carbolic acid and carbolized sawdust, is placed in all the pans during use. The pans are taken to a farm at Caulfield, where, at present, the contents are buried in trenches; but it is proposed to manufacture them into poudrette by a patent process. In this process the faecal matter is firstly to be heated in a retort, and secondly dried by hot air. Any gases formed are to be passed through a destructor containing soda-lime, and exposed to a considerable heat; then the gases pass through a vat containing sulphuric acid, and are to be finally condensed. The pans are to be cleansed and disinfected by steam, at a pressure of about 5 lbs., for about 10 minutes. The cost of the appliances necessary to treat all the night-soil of St. Kilda would be £1,800. The cost of pans to the householder is 8s. 6d. per closet, and the pans last two years; the total cost of the service is £1 per annum. It has been proposed to establish the poudrette factory at some distance from town, and convey the night-soil to it by rail. If this were done the total cost to the householder would be only 17s. per annum. The system can be and has been carried out without any nuisance.

Hesse's system of removing and dealing with night-soil, 3412-3475.

In use at St. Kilda, 3412-3419.

Description of process, 3420-3455.

Pans in duplicate and covered during removal, 3420.

Proposed mode of treating the night-soil, 3432-3455.

Cost of system, 3456-62. Causes no nuisance, 3464.

WILLIAM JOHN RITCHIE SIMPSON, M.D., Ch.M., Diplomat of Public Health, Cambridge, Health Officer of the city of Calcutta.—It is proposed, in Calcutta, to introduce a system of burning house refuse in destructors, and he has recommended Fryer's

Proposed treatment of house refuse at Calcutta by destructors, 5617.

Present sewage of
Melbourne; subsoil
contamination, 5616-55.

Treatment of night-soil,
5656.

Deep drainage necessary,
5682.

Sewage farms, 5667-71.

Effect of deep drainage
on health, 5735-40.

Walker's candle factory a
nuisance, 6638-45.

Apathy of local board in
repressing nuisance,
6646-52.

Action of Central Board,
6648, 6654-60, and 6666-67.

Action at common law
and counsel's opinion,
6648-49.

Nuisance from Colling-
wood tip and tramway
drain, 6662-66.

destructor for the purpose, as he was very pleased with what he saw of its action at Warrington, and as it has been introduced in London, Leeds, and other places. The present system, in Melbourne, of surface drains for sewage is a very bad one. At North Carlton he inspected a number of lanes, and saw the surface drainage coming down a hill for about 150 yards. The houses at the top of the hill were all right, but at the lower part there was scarcely a house that was not damp. In low-lying districts there will be a rise of the subsoil-water, and an accumulation of filth that cannot get away. In other parts of the town he found the sewage-water stagnant in the channels, or if flowing not flowing properly. Very often the channels were broken, and soakage occurred into the soil. In many of the backyards there is no drainage at all, the slop-waters simply soak into the ground. The channels are made of bluestone pitchers, often not cemented; in many places sinkages have occurred, resulting in stagnant pools. This condition of things will ultimately become a very serious matter for Melbourne. It is well known that a rise in the subsoil-water is a cause of all kinds of disease, especially typhoid fever and malaria. In Aberdeen, one portion of the town had drains very much as Melbourne has; the houses were damp—a peculiar form of typhoidal fever was always present there. In going to Armadale he noticed a row of houses with pan-closets in the backyard, and behind them a stagnant ditch into which all the surface drainage must go and ferment and putrefy. The present system of dealing with night-soil in Melbourne is about the crudest attempt at a pan-closet system he has seen. Any kind of pan is used; it is emptied and returned uncleaned. With a proper pan system a special kind of pan is used; it is removed daily, and a clean pan put in its place. The dirty pan is washed with a disinfectant before being returned. If the pans in Melbourne are ever returned after emptying to another house, there would be risk of transferring typhoid fever from the one house to the other, if there were fever in one of the houses. He considers that for a large population with plenty of water the pan system, however carried out, is unsatisfactory; for a city like Melbourne the water carriage system is the best. If a pan system be retained the contents should be converted into pondrette in a destructor. He proposes to use Fryer's destructors in Calcutta, as they treat faecal as well as house refuse. To treat the house slops and get rid of the present insanitary conditions in Melbourne a system of drainage is necessary. Even in Calcutta he regards the treatment of night-soil in destructors as only a transition stage until a drainage and water carriage system can be introduced. No nuisance is caused by sewage farms, if properly managed; if the soil be overcharged it becomes offensive. He has seen a small sewage farm at Aberdeen, and those at Southampton and Paris. The latter is near the city, with houses within half a mile of it. At Aberdeen, when the drainage system was introduced, there was a considerable reduction in the death rate from phthisis and from typhoid fever, and this was *pari passu* with the progress of the drainage, and the effect was due to the drainage of the subsoil and to the removal of the ordinary sewage of all kinds. No special provision was made for draining the subsoil.

JOHN BUCHAN.—He and other residents of Studley Park are annoyed by offensive fumes from Walker's soap and candle factory in Collingwood. The odour extends for about one-eighth of a mile, is intermittent, and lasts about two or three hours at a time. The nuisance has existed for fifteen years at least. It is so great that he has to close up his house. Complaint had been made to the Local Board of Health, without avail, as they stated that they found the premises clean and free from offensive matter. Then he wrote to the Central Board, who referred him to the 6th clause of the Health Act to the effect that he must apply to the Local Board. Then a meeting of residents was held, at which it was resolved that proceedings be taken at common law against Mr. Walker, and £200 was subscribed for the purpose. Counsel's opinion was taken, and it was decided that proceedings could be taken only by the Local Board of Health. A certificate signed by ten residents was forwarded to the Local Board, and a copy of this was sent to the Central Board, but no action was taken. The street sweepings of Collingwood are deposited in a clay hole on the banks of the Yarra, and when it rains this matter is washed into the river close to the ferry. The Tramway Trust have constructed a drain that discharges into the river just at the ferry.

A P P E N D I C E S .

REPLIES FORWARDED BY MUNICIPALITIES TO A CIRCULAR LETTER FROM THE COMMISSION.

ANSWERS.

| ANSWERS. | | | | | | | | | | | | | | | | | | | |
|----------|---|--|---|---|---|--|---|--|---|--|---|--|---|---|--|---|---|--|--|
| No. | QUESTIONS. | MELBOURNE. | FITZROY. | COLLINGWOOD. | RICHMOND. | SOUTH MELBOURNE. | PRAHRAN. | PORT MELBOURNE. | WILLIAMSTOWN. | BRIGHTON. | BRUNSWICK. | HAWTHORN. | FLEMINGTON AND KENSINGTON. | FOOTSCRAY. | NORTHCOTE. | PRESTON. | MALVERN. | BOROONDARA. | HEIDELBERG. |
| I. | State (a) Population of district; (b) Area of district; (c) Number of houses in district | (a) Estimate, 73,800. (b) About 4,700 acres. (c) Estimate, 17,000. | (a) 28,644. (b) 915 acres. (c) 6,308. | (a) 30,000. (b) 1,241 acres. (c) About 6,950. | (a) 37,078. (b) 1,430 acres. (c) About 8,000. | (a) 40,505. (b) 2,311 acres. (c) 8,661. | (a) 33,925 (1887). (b) No answer given. (c) 7,850. | (a) Population, 11,403. (b) Area, 2,366 acres. (c) 2,617 houses. | (a) 12,749. (b) About 2,540 acres. (c) 2,700. | (a) 7,645. (b) 3,288 acres. (c) 1,508. | (a) 15,500. (b) 4 square miles. (c) 3,100. | (a) 14,500. (b) 2,389 acres. (c) 3,450. | (a) 7,013. (b) 1,078 acres. (c) 1,495. | (a) 11,762. (b) 4,525 acres. (c) 2,721. | (a) About 5,100. (b) 2,700 acres. (c) 890. | (a) About 3,000. (b) 17 square miles. (c) No answer given. | (a) 3,906. (b) About six square miles. (c) 615. | (a) 3,466. (b) 12½ square miles. (c) 803. | (a) About 3,000 to 3,500. (b) 41 square miles. (c) No answer given. |
| II. | Have you a survey of the district, showing levels? | Sections showing levels of all the streets are in the office. A contour survey of the Metropolitan District has been prepared also by the Surveyor-General. | No. | List of bench marks and plan of the city forwarded herewith. | Yes; a map of Richmond, giving 5-ft. contour lines. | Yes. | No complete survey. | No. | Not of the whole—only several parts. NOTE.—The greater portion of the town is made up from private subdivisions, of which no accurate record has been kept in this office. There is therefore no reliable plan north of Ferguson street. The town surveyor is reducing all levels taken to the same datum—M. H. T. low-water mark, so that they may be used in contour plan when one is compiled. | No. | Yes; but of portions only. | No. | No. We have plans showing the levels of all streets taken over by the council. | Yes. | No. | No. | No. Malvern being a shire the levels have not been fixed. | Not aware. | No; an application has just been made to Government to extend the contour survey to this shire. |
| III. | What length of streets in the district is (a) Paved; (b) Unpaved; (c) Channelled; (d) Unchannelled? | (a) About 73½ miles. (b) Not obtainable; streets not yet all defined. (c) About 76½ miles. (d) Same answer as b. | (a) 39½ miles. (b) Nil. (c) 39½ miles. (d) Nil. | (a) About 45 miles are metalled and channelled. (b) About 30 miles of lanes are pitched, metalled, and channelled. (c) No answer given. (d) About 5 miles of streets and lanes are not made. | (a) Nearly 40 miles. (b) About 10 miles. (c) About 40 miles. (d) About 10½ miles. | (a) 16 miles 26 chains metalled full width, 22 miles 7 chains metalled in the centre. (b) 19 miles 65 chains. (c) 39 miles 11 chains. (d) 19 miles 53 chains. | (a) 54 miles and 25 chains. (b) Nil. (c) 49 miles and 50 chains. (d) 4 miles and 55 chains. | (a) 13·8 miles. (b) 4·1 miles. (c) 13·8 miles. (d) 4·1 miles. | (a) If paved roadways are meant, there are none. If footpaths—9 miles of streets paved one side, and 12½ miles of streets paved both sides. (b) Length unpaved, 20 miles. (c) Length of streets channelled, 21 miles. (d) Length of streets unchannelled, 20 miles. | (a) 12½ miles. (b) 42 miles. (c) 12½ miles. (d) 42 miles. | (a) 50 miles. (b) 200. (c) 55. (d) 195. | (a) None (except right-of-ways). (b) 37 miles public streets are formed, and nearly all metalled. (c) 50 miles of channelled. (d) 24 unchannelled. | (a) 20 miles of streets metalled. (b) 50 miles of streets unmetalled. (c) 30 miles channelled. (d) 40 miles unchannelled. | No record kept. | (a) 10 miles. (b) 80, mostly private. (c) About 600 chains = 7½ miles. (d) About 80 miles. | (a) Streets metalled, say 18½ miles that is constructed. (b) No answer given. (c) About 7 miles channelled and paved. (d) The remainder not channelled. | (a, b) All are macadamized. (c) About three miles. (d) This question cannot be answered at present. | (a) Asphalt about 1 mile. (b) No answer given. (c) Say about 5 miles. (d) No answer given. | (a) None. (b) No one seems to know the exact length; but, excluding newly-formed streets not taken over by the council, I should estimate the length at about 40 miles of streets and roads. (c) I should say about 5 miles. (d) About 35 miles. |
| IV. | (a) Of what material, and (b) In what manner are the paved streets paved? | (a) Redgum wood blocks; bluestone cubes or pitchers; and macadamized. (b) Wood blocks are laid on concrete, and grouted either with preparation of tar and screenings, tar and sand, or cement—stone pitchers (answered by No. V.). Macadamized roads are formed in the well-known manner of spreading broken stone on larger-sized stone as a foundation, and well rolling same. | (a) By far the largest proportion, say 32½ miles, of the streets of the city are paved the full width, a coating 9 in. to 12 in. thick of macadam. (b) About 4½ miles are macadamised 18 ft. wide only, but in the course of the next two years it is expected that the whole of them will be coated full width. Two streets, viz., Brunswick-street, 80 chs., and Gertrude-street, 40 chs., are paved with wood blocks laid on concrete, excepting in channels. Some narrow streets (length 80 chs.) have been pitched the full width between channels with stone cubes. | (a) In the usual manner with bluestone metal. (b) No answer given. | (a) Bluestone pitchers are used. (b) Ordinary basalt for the sole, best bluestone for the surface coating; the sole is laid with wedge-shaped rough pitchers, roughly hewn, laid in straight-lined courses across the traffic line, well hearted with rubble, and closed up at the surface with small spalls well packed in; the depth of the sole is 8 in., and on it a 6-in. coat of 2½-in. bluestone is spread, blinded, and rolled. | (a) Flagging in the older streets, but generally asphalt. (b) In the ordinary style of asphalt for the footpaths. The roadways are generally metalled, but some in the southern part are being constructed with tarred metal and rolled. | (a) Broken stone, macadam. (b) The middle portion is macadamized, except in the main streets, which are metalled across the whole width of roadway. Most of the footways are laid with tar paving, except in the new streets. | (a) Bluestone. (b) 1. Metal on rough pitched foundation. 2. Tarred metal on coarse metal foundation. | (a) In most cases with tar paving, about 3½ in. thick; in one or two streets with bluestone flags, 3 in. thick; and in rare cases with bluestone pitchers, 12 in. x 9 in. x 6 in. (b) The street is first channelled, and the path formed with slope of ½ in. to foot, falling from back to front. A layer of ½ in. bluestone screenings is then put down (screenings first well mixed with coal tar from Gas Co.), and rolled; a layer of fine screenings, about 1 in. thick is then put down and rolled. Dust then rubbed in. | (a) Metal, sand, and tar for pavement; metal for streets. (b) Laid in the above order and well rolled. | (a) Stone. (b) Some rough-pitched and metalled, others metalled only. | (a) and (b) Some metalled from channel to channel; others only in the middle. | (a) Bluestone metal. (b) Placed on the streets, blinded, and rolled. | (a) Asphalt. (b) No record kept. | (a) Bluestone (basalt). (b) Partly metal, on Telford paving. Where foundation is good, macadam only. | (a) Dressed bluestone pitchers. (b) No answer given. | (a) Bluestone road-metal. (b) No answer given. | (a) Asphalted. (b) Fair. | (a) No answer given. (b) The greater portion of the roads and streets are metalled with bluestone metal. |
| V. | What is the general method of laying down the channels? | Of "pitchers," 9 in. wide on top, not less than 8 in. wide on bottom, not more than 12 in. long, nor less than 8 in. deep (except in by-streets, where the depth is fixed at 6 in.), of sound bluestone, laid on a bed 3 in. thick of coarse sand, well rammed and back-rammed, and (since the past twelve months) grouted with lime and sand grout, to make the joints impervious to water. They were formerly simply flushed up with sand. The pitchers are specially picked out to give as smooth a "face" as this class of work will permit. | Is to set five courses of stone pitchers, 9 in. wide x 6 in. deep, laid on a bed of ashes or sand, the joints being grouted with sand. | Stone pitchers laid on a bed of sand, ashes, and jointed as close as possible. In one instance an asphalt channel was laid as an experiment, an earthenware tile was laid at the bottom; this answered very well. | In hammer-squared blocks, 9 in. wide and from 6 in. to 8 in. deep, laid and well rammed on a 2½-in. bed of sharp sand, in straight-lined break-joint courses, well grouted with sand and water. | Pitchers set in sand, well rammed, joints grouted with sand. | The channels are laid with squared stone pitchers from 1 ft. 6 in. up to 9 feet wide. | Channels are made with 6-inch pitcher channels, generally 5 pitchers wide, laid in sand, and rammed to grades; the joints grouted with wet sand. | Channel formed and pitched to lines and levels directed. Pitchers approved, close-grained, hammer-dressed, bluestone pitchers, close-jointed, smooth-faced, and laid in a 3-inch bed of approved sand, grouted with sand, and well rammed to the lines and levels directed. No pitchers greater than 14 in. long, and no joints wider than ¾ in. Pitchers to break joint throughout; each pitcher having a lap of not less than ½ of its length over underlying joint. Water-tables shall be formed to edge of pitching, with regular curvature from centre of road. Provision made for passing all drain-pipes through into channel as directed by surveyor. All damage to drain, gas, and water-pipes to be made good. Work to be properly finished, with a good face, to town surveyor's satisfaction. Pitchers, 12 in. x 9 in. x 6 in. NOTE.—New channels are now being grouted with cement to form a water-tight joint for the three bottom rows of pitchers. Above this only storm waters soak through, and these are not detrimental to health. | Bluestone pitchers, grouted with tar and cement. | With bluestone pitchers, set and grouted in sand. | The channels are of bluestone hammer-dressed pitchers laid on sand; the joints are tarred as soon as the pitchers are thoroughly set. | Square dressed pitchers set in sand, and then flushed with sand and well rammed. | Pitched channels, asphalt channels. | Hammer-dressed stone in courses, laid on thin bed of gravel or sand, grouted with sand. Sometimes mixed with gas-lime. | Good bluestone pitching laid on a coat of sand. | With bluestone pitchers—joints left open, and carefully grouted with cement. A few trials have been made with asphalt and concrete, too recently to form an opinion as to their durability. | Dressed and rough pitchers. | Of bluestone pitchers laid in sand, and the joints well grouted with sand. In some cases, where the foundation is bad, I have adopted the plan of laying them on concrete, and grouting the joints with cement. |

| No. | QUESTIONS. | MELBOURNE. | FITZROY. | COLLINGWOOD. | RICHMOND. | SOUTH MELBOURNE. | PRAHRAN. | PORT MELBOURNE. | WILLIAMSTOWN. | BRIGHTON. | BRUNSWICK. | HAWTHORN. | FLEMINGTON AND KENSINGTON. | FOOTSCRAY. | NORTHCOTE. | PRESTON. | MALVERN. | BOROONDARA. | HEIDELBERG. |
|-------|--|---|---|---|---|---|---|---|--|---|--|---|---|---|--|---|--|---|--|
| VI. | What proportion, if any, of the channels have smooth surfaces, without any crevices? | With the exception of a very small proportion of channels formed of "tar pavements" (which are not found to answer where heavy traffic occurs), the surfaces of the channels are more or less uneven, consisting, as above described, of pitchers. | None of the channels have smooth surfaces without crevices. | Only the above one situated on the Heidelberg-road. | Not any; but it is customary to select the smoothest-faced pitchers for the lowest course of the channel. | None. | A very small length of channel has been laid with tar paving, which, however, does not stand the traffic, as it wears into holes. The pitching has, of course, a rough surface. | None. | A very small proportion indeed. It is only during the past twelve months that any attempt has been made to introduce work of this kind. Old pitchers formerly used on the pavement have been taken up, the path tar-paved and the pitchers used for channelling. Having had years of traffic they have very smooth faces, and make good channels. | Nil. | There are no crevices, the joints being well filled with sand; no asphalt channels have been laid nor have any stone channels been cemented. | None. | None. | No record kept. | None; all hammer-dressed ordinary squared stones. | None. | Answered in preceding question. | Not known. | None. |
| VII. | Have all the channels such a fall that fluid does not stagnate in them? If not, specify the exceptions. | Yes. | The channels have all sufficient fall to prevent water stagnating therein, though not in all cases as much as is desirable. | Yes. | Yes, with very few exceptions not worth mentioning. | No. In about one-third of the city the fall is good, in the other parts the flow in the channels is sluggish. | The channels generally have a very good fall (no fluid stagnating therein) with very few exceptions, which will mostly be rectified by construction of sewers now in progress. | The fluid stagnates more or less in most of the channels, the fall generally being insufficient for free flow. | In the great majority of cases, yes. There is much stagnation due to unevenness in laying and bad workmanship. This is being gradually removed by re-setting, at which two gangs of men are always employed. | Yes. | With a few unimportant exceptions, yes. | Yes. | Yes. | I believe so. | Channels are laid with a minimum fall of 3 inches per chain. A few old channels have small subsidences. | Yes. | Yes. | Good fall. | One channel at Alphin which is now altered to increase fall; one short channel at Cape-street, which is proposed to alter shortly. |
| VIII. | Are the channels periodically flushed? If so, at what intervals of time? | No; carbolic acid and manganate of soda used to disinfect the sewers. | No; but are swept regularly twice in each week. | In summer months some are flushed twice in each week. | Yes, at the periods of rain-fall, but not artificially, except pipes, culverts, &c., about once a fortnight, according to requirements. | They are swept, but not flushed, as the water supply is so defective. | Yes; some thrice, some twice, and all once a week, according to the exigency of each street. | The channels in the principal streets are swept daily; in other streets weekly. | During summer, about once every three or four days. Have begun to use Morris Little and Son's "Phenyle" disinfectant with much benefit; prevents green stagnant matter forming. | Yes; as required. | Yes; once and twice a week. | Channels are swept at least once per week; in main streets oftener. Chloride of lime and sulphate of iron used to disinfect the sewers. | Yes. Swept every week. | No. | No. Swept only irregularly once a week. Main road channels, part twice, others as urgency requires. | Yes; weekly. | No. This question does not apply to shires; they are swept weekly. | In township swept once weekly. | There is no means of flushing; we are most anxious to get steps to get water supply but can obtain no reply to whether the Government have matured the water supply scheme they were in contemplation of. |
| IX. | Are there separate drains for the slops and liquid refuse from the houses? | No. | No. | No. | No. | No. | No; all house liquids, save night-soil, are conducted by the street channels, or by sewers to (a) the Yarra or to (b) Hobson's Bay. | No. | No. Storm-water and polluted waters occupy the same channels and find the same outlets. | In most cases. | No. | No. | No. | No. | No. | Not in many cases. | As above. | Drain to road channels. | No. |
| X. | Describe shortly the general course of the drainage. | Western fall—Into storm-water channel in King-street, and thence to Yarra; also through North Melbourne, and to Moonee Ponds Creek. Central fall—By means of storm-water channels of Swanston and Elizabeth-streets into Yarra. Eastern fall—North-eastern portion—Into Reilly-street drain, through Fitzroy and Collingwood. East Melbourne district—Into the Richmond drain, Swan-street, and Jolimont drains. South of Yarra—Crossing St. Kilda-road to South Melbourne. | What is known as the Reilly-street drain, running easterly, divides the city across the centre, and practically the whole city drainage flows into this. In the southern half three underground main sewers and several miles of pipes have been laid for the purpose of collecting the storm-water and drainage from the streets and conveying it to Reilly-street drain. In the northern half a large underground storm-water drain has been constructed for the same purpose, but on this portion much of the drainage still flows into the main drain (Reilly's) in the open street channels. | Open channels constructed with stone pitchers, large open pitched drain constructed by the council with money voted by Parliament in Reilly-street. Numerous egg-shaped sewers in various parts of the city, and which receive nearly all the drainage of the city, their length being about 5 miles. | Eastward and southward to the Yarra. | On the east of the city the drainage is carried off by the Hanna-street drain. On the north-western side by the Johnson-street culvert. The central and western portions by the Barrett-street drain to the Port Melbourne lagoon. On the southern portion the drainage is by the Macgregor-street culvert. | The general course of the drainage is from Armadale at the south-east angle of the city to South Yarra at the north-west angle, with smaller areas on the western side flowing into Melbourne City and St. Kilda Borough. | The drainage of about $\frac{1}{4}$ of the whole borough is carried to the lagoon through two main drains, the general direction of which are west to east; the drainage of the remainder flows northerly, and is led to the Yarra through a 12-inch pipe which follows the course of an old gully. | The town is divided into two parts by a watershed line running down the centre of the peninsula adjacent to and approximately parallel to the railway line. East and north of the watershed line the drainage flows down numerous streets directly into Hobson's Bay. On the other side of the line it flows into Port Phillip Bay and Kororoit Creek. | There are four main drains, commencing in other districts, passing through the town, and falling into Hobson's Bay. | On the east of Sydney-road to the Merri Creek; on the west to the Moonee Ponds. | Hawthorn is traversed from west to east by the natural water-courses, now designated the main drain. One branch enters Hawthorn at the junction of Camberwell and Burke roads, and the other a little to the west of the junction of Barker's-road with Burke-road. These unite in Grace Park and discharge into the Yarra, above Swan-street bridge. The street channels discharge into this main drain. | All drainage north of Racecourse - road flows through barrel culverts into Moonee Ponds Canal. All drainage from east side of Kensington Hill flows into Moonee Ponds Canal. All drainage from west side of Kensington Hill flows into Saltwater River. | From the various right-of-ways and streets into the creek, thence into the river. | The borough is only five years old. Not much done in way of permanent drainage. The S.E. portion drains to Heidelberg-road and to Merri Creek; a portion of this is to be constructed at once. The west part drains westerly to Merri Creek. A small portion N.E. (hardly any population) drains to Darebin Creek. | Part of the shire, the East Riding, finds its way to the Darebin Creek. The Central and West Ridings all flow naturally to the Merri Creek. | The general course is north-westerly, into the Gardiner's or Kooyong Coote Creek, and all ultimately into the River Yarra Yarra. | From Camberwell to Hawthorn, W. Creek to Gardiner's Creek, to Connor's Creek, to Koonong Creek. | In Fairfield and Alphin the drainage finds its way into the Merri and Darebin creeks and into the Yarra; but the country is flat, and drainage wanted. In Heidelberg the drainage generally collects at the junction of Cape and Burgundy streets; thence it is conveyed by a sewer about 6 ft. diam. across the river into a creek which discharges into the Yarra. The Greensborough drainage finds its way into the Plenty River and in Nillumbik into Diamond Creek. |
| XI. | Where does the drainage ultimately discharge? | The River Yarra. | The drainage thus conveyed to the Reilly-street main drain ultimately discharges into the Yarra. This drain is only partially lined, and it is a matter of complaint that, although it receives the drainage of about 700 acres in the city of Melbourne, and about 200 acres in the town of Brunswick, those municipalities will contribute nothing to the cost of its construction. | Into the River Yarra. | Into the River Yarra. | River Yarra, Port Melbourne lagoon, and the sea. | The greater part discharges in the River Yarra; the western areas discharge into Hobson's Bay through Albert Park. | (1). Into the lagoon, which communicates with the Bay. (2). Into the Yarra. | Into the River Yarra, Hobson's Bay, Port Phillip Bay, and Kororoit Creek and Stony Creek. | As above. | Hobson's Bay. | River Yarra. | Moonee Ponds Canal and Saltwater River. | Saltwater and Yarra rivers. | 90 per cent. to Merri Creek; remainder to Darebin Creek; all ultimately to the Yarra. | The Yarra. | Into the River Yarra Yarra. | River Yarra. | Into the Yarra. |
| XII. | (a) What amount has been expended on drainage during the past 10 years? (b) What amount was so expended in 1887? | (a) £72,827. (b) £1,117. | (a) Expended in ten years to 31.12.87, including private streets, and under schedules of No. 2 and 3 Loans, £79,192. (b) £26,973. | (a) Since 1885, £19,300. (b) No answer given. | (a) About £25,000. (b) About £2,000. | (a) £6,779. (b) £2,001 6s. 8d. | (a) No answer given. (b) No answer given. | (a) No separate account kept for drainage. Estimate about £20,000 in 10 years. (b) Estimate about £2,000 in 1887. | No answer given. | (a) £5,135 18s. 4d. (b) £609 16s. 10d. | (a) £79,952 13s. 6d., which embraces all street contract work. (b) £20,905 4s. 9d., which embraces all street contract work. | (a) Main drain. (b) Excluding channelling, £2,372 5s. 2d. in 1887; excluding channelling, £9,315 in 1888. | (a) Borough has been formed six years; in that time £9,185 6s. 2d. has been expended. (b) £2,272 12s. 11d. | (a) £3,000 has been appropriated for main drain out of new loan. (b) No answer given. | (a) The only work of drainage has been in the way of street channels. | (a) Cannot inform, but approximately say, £500. (b) About £170. | (a) Cannot say. (b) £250 (estimated). | (a) Not aware. (b) £671 2s. | (a) The only drainage work of which I find any records are channelling and these are not distinguished from road repairs and formation of footpaths. |

ANSWERS.

| No. | QUESTIONS. | MELBOURNE. | FITZROY. | COLLINGWOOD. | RICHMOND. | SOUTH MELBOURNE. | PAHRAN. | PORT MELBOURNE. | WILLIAMSTOWN. | BRIGHTON. | BRUNSWICK. | HAWTHORN. | FLEMINGTON AND KENSINGTON. | FOOTSCRAY. | NORTHCOTE. | PRESTON. | MALVERN. | BOROONDARA. | HEIDELBERG. |
|--------|---|---|--|--|--|--|---|--|--|--|--|---|---|--|--|--|--|---|--|
| XIII. | Describe the method adopted for street cleansing, and scavenging | Main streets cleansed daily; others three and twice weekly; scraped or swept thoroughly from building line to building line, the stuff being removed within from one to three hours; refuse from houses and yards is removed each time the streets are cleansed, but never less than three times weekly; all sumps, gullies, traps, inlets to drains, &c., at least twice weekly, and oftener if directed; cab-stands, dray-stands, and markets are cleansed at least daily; fish-market twice a day. | The main streets are swept daily with horse-brooms; the other streets less frequently, as required. All channels throughout the city are swept by hand-brooms twice weekly. Gullies and catch-pits connected with the underground drainage are cleansed twice weekly. The debris collected is removed in carts the same day. | Channels are swept twice in each week, the household and street refuse being removed also twice in each week. | The principal streets are scraped and swept with horse machines, partly by contract and partly by day labour, and three contracts are entered into, one for each ward, for the scavenging of the city. All channels, footpaths, right-of-ways, pipes, culverts, &c., to be cleansed twice a week, with the principal crossings and some public places daily. | The channels are swept, some once, others twice a week, a cart follows and removes the sweepings. Each householder is required to provide a box or other receptacle with a capacity of not more than five cubic feet for house refuse, which the contractor removes once a week. | Channels, hand swept; roadways, machine swept and scraped. | Channels are swept down and solid matter received from them and carted away. The catch-water basins to the main drains are cleaned out about once in three weeks. The streets are scraped as mud is formed, and the scrapings removed. | For cleaning gutters—scavengers with hand-brooms, and hatchets or picks for raking grass out of joints; eight men for whole town, with districts for sweeping apportioned to them; material swept out of gutters on to side of road, taken up by draymen in less than three hours. Roads cleaned in wet weather by hand-scrappers and shovels; no machines here yet, but have obtained authority to purchase two scrapers recently. Channels flushed down with hose and hydrant; also culverts periodically flushed out. | Hand sweeping and flushing. | The work is carried out by contract; the streets are cleansed in the usual manner, and rubbish removed from dwellings. | The streets are swept or scraped. The house refuse is collected in carts. | All right-of-ways and channels swept and cleansed once a week by the borough laborers. All rubbish put in boxes and removed by corporation carts. | Two men employed thereat in each ward. The scavenger's cart goes round the north ward on Mondays and Tuesdays, middle ward Wednesdays and Thursdays, south ward Fridays and Saturdays. | A few day labour men are employed. Carts supplied by contract. Road scrapings and removal of mud in wet weather. Spreading metal, &c. More attention paid to channel sweeping in fine weather. | Horse scraper. | Question inapplicable to a shire. | Road scraper; day labour sweeping channels. | Some of the channels are swept daily when necessary, others once a week. |
| XIV. | What is done with the refuse from the streets? | That valuable for manure is used up in the city gardens, reserves, tree plantations, &c.; the remainder is deposited chiefly at the "West Melbourne Tip" (near North Melbourne Railway Station.) | It is carted to the Edinburgh Gardens, where it is immediately trenched in and covered with earth, and soultized for garden purposes. | Carted away to some low-lying land and covered with suitable material. | If not offensive matter, deposited on vacant low-lying lands in the city; if otherwise, in corporation tips. | Taken to tips, and covered over. | Deposited in excavation in Toorak Park, Orrong-road, and covered with fresh maiden loam, load by load. | Street scrapings are used to form footpaths, &c. | Carted to vacant pieces of land and deposited. These tips are generally old quarry holes, and in some cases are right in the heart of the town, as at Stevedore-street, and cause much nuisance. There is one on the Esplanade or Back Beach into which most of the refuse is now put. I have recommended the establishment of one of Manlove, Elliott, Fryer and Co.'s destructors (Nottingham) for refuse of Williamstown and Footscray, to be erected on Stony Creek. | Utilized for filling up holes and low-lying lands. | Deposited in quarry-holes. | Used for making up footpaths and low-lying land. | Placed on tips within the borough, and covered with earth. | Deposited at the municipal tips. | The refuse obtained is almost wholly ground-up metal from the main road. Used to make up a high embankment, and partly for footpaths. | The best is used for footpaths, the refuse for filling up ravines or old channels. | As above. | Road scrapings, widen embankments and repair footpaths. | The road-scrappings are frequently used for blinding on the roads, and when not so used they are used for filling low ground. |
| XV. | (a) What is done with the refuse from back-yards, and where is it deposited now? (b) Where has it been deposited during the past 10 years? | (a) At the "West Melbourne tip," there covered up with dry earth. (b) At above "tip," and also at a "tip" known as the "Yarra Bank tip." | (a) The refuse from back yards is dealt with in the same manner, and has been so carted for the past 7½ years. (b) Formerly it was all carted to some vacant low-lying land in the centre of the city, near the Gasworks. | (a) Treated the same as other refuse at Flockhart-street, and at the eastern end of Ramsden-street. (b) Various places, but lately on land adjoining Nicholson-street, near Gipps-street and the Marine-parade. | (a) Deposited in corporation tips. (b) Various places. | (a) Placed in tips, and covered over; the present tip is in Dodds-street. (b) In reserves and streets. | (a) Vide XIV. (b) On low land adjoining main drain South Yarra; and in brick holes, Orrong-road, and in Toorak Park. | (a) Buried in reserves. (b) Buried in reserves. | (a) Put out in boxes on street once a week, and taken up by scavengers and carted to the nearest corporation tip. (b) In the various corporation tips in the town. | (a) As above. (b) As above. | (a) As in above answer, XIV. At the time of deposit it is well covered with earth. (b) Similarly dealt with. | (a) Buried in trenches in the reserve; 2 feet of cover allowed. (b) No answer given. | (a) Placed on tips and well covered with earth. (b) Same places. | (a) Deposited at the municipal tips. (b) Disposed of by the residents. | (a) Carted to an old quarry-hole. Superficially burnt occasionally. Quantity is small. (b) I think it has been buried in gardens, &c., being a rural district until recently. | (a) The occupiers either use it in their gardens or cart it away. (b) No regular system. | (a) The quantity does not exceed two cart loads per week; at present it is deposited in a disused brick-clay hole. (b) Used as manure on the premises. | (a) Carted away on farm; for about 18 months not required, as population sparse utilized refuse as manure. (b) No answer given. | (a) The population being scattered, there has been, up to the present time, no necessity for the council or Local Board of Health to take any steps as to the disposal of it, as no nuisance has hitherto arisen. |
| XVI. | Is it within your knowledge that dwelling-houses, schools, or other buildings have been erected on deposits of refuse, or on ground filled up with refuse, in your district? If so, specify instances | No. | Dwelling-houses have been erected on land at North Fitzroy, where quarry-holes were filled in partially with refuse from streets and houses. I am unable to do more than indicate the locality, which is known as Sec. F, or the Quarries, Nicholson-street. | Only in one instance, viz., on a portion of the land between Gipps and Vere streets and Nicholson-street; this ground has not been used as a depot for years, and prior to being built upon a thick covering of clean earth was placed where the deposits had been made. | No. | It is not within my knowledge that buildings have been erected on such filled ground. | Yes; in Clara-street, Ivy-street, High-street, and many other places, notwithstanding repeated protests by the Council of Prahran, through the old Central Board of Health. | No. | I do not think any have been so erected. | Nil. | No. | No. | No. | No. | No. | No. | No; no such deposits have been made. | No. | No. |
| XVII. | What is the cost per ratepayer for scavenging and disposal of refuse? | £1 2s. 8d. per annum; or 4s. 6d. per head of population. | 10s. per ratepayer. | Say 1s. 9d. per head. | About 2s. each for 8,000 ratepayers, paid out of general revenue. | About 8s. 9d. per annum. | The cost—some £5,000—is paid out of the rates (9,050 ratings); the cost distributed would be about 12s. per ratepayer served. | Estimated at 6s. 6d. per ratepayer per annum, taking "ratepayer" to mean a person on the rate-book. | Total cost, £1,860 per annum; about 10s. 6d. per ratepayer. | 4s. 4d. per annum. | £1 per annum. | No charge is made to the ratepayers. For yard refuse a horse and cart and two men are employed. | 3s. 6d. per ratepayer per annum. | About 10d. per annum. | 8,200 valuations at 1s. 9d. = £700; or, per house, 890 at 19s. 9d. = £700. | Nothing. | This question does not apply to this shire. | About 1s. 8d. per ratepayer. | As the council do not dispose of the refuse, it is impossible to say the cost. |
| XVIII. | (a) How often, and (b) In what manner is the night-soil collected? | (a) Once weekly, save special public buildings, which are attended to as often as is found necessary. (b) By means of iron night-carts, specially designed, with proper valves and traps, to prevent the escape of any offensive smell. These carts, on each time of being emptied, are thoroughly washed clean; and once in every four weeks are internally cleansed and coated with hot tar. | (a) The night-soil is collected weekly by carts. (b) The pan system is in use. | (a) Mostly once in each week. (b) Pan system, collected by nightman after 11 p.m. | (a) Ordinary household once a week as a general rule, twice where necessary. (b) By contracts with the council. | (a) Generally once a week, some twice weekly. (b) In the ordinary style by the pans being emptied into the carts. | (a) Once per week. (b) In iron carts, closed when full. | (a) Weekly. (b) Removed by contract. | (a) Weekly. (b) By contractor with night-carts (closed). | (a) Weekly. (b) Night-carts. | (a) Once a week. (b) In carts. | (a) Weekly. (b) Pans are emptied into close carts. | (a) Weekly. (b) By contractor using his own night-carts and removing the night-soil at night. | (a) Weekly. (b) Night-carts in the ordinary manner. | (a) A contract is arranged for the removal once a week, more if required. (b) Carts out every night. Ordinary night-carts. | (a) Once in each week. (b) Carted away by council. | (a) Weekly. (b) By the ordinary iron night-carts. | (a) Weekly at Camberwell and Surrey Hills. (b) Nightman. | (a) When necessary. (b) The inhabitants make their own arrangements at present; but the Local Board of Health are about to undertake the collection of night-soil as soon as the necessary preliminaries for making a by-law have been gone through. |

ANSWERS.

| No. | QUESTIONS. | MELBOURNE. | FITZROY. | COLLINGWOOD. | RICHMOND. | SOUTH MELBOURNE. | PRAHRAN. | PORT MELBOURNE. | WILLIAMSTOWN. | BRIGHTON. | BRUNSWICK. | HAWTHORN. | FLEMINGTON AND KENSINGTON. | FOOTSCRAY. | NORTHCOTE. | PRESTON. | MALVERN. | BOROONDARA. | HEIDELBERG. |
|--------|--|---|--|--|---|--|---|--|---|--|--|---|---|---|---|---|--|--|--|
| XIX. | Are any disinfectants used in this service? If so, what disinfectant? | Carbolic acid and manganate of soda. | Yes; Hesse's soluble carbolic. | None compulsory; but many use a disinfectant, such as ashes, carbolic, Hunter's, &c. | Nil. | Only in case of some specially offensive nuisance, or disease in the vicinity. Carbolic. | No. | Yes, but cannot say what. It is part of the contract that the public nightman shall use. See copy of specification. | No answer given. | Yes; various. | In some instances Hunter's disinfectant and carbolic. | Yes; various. | No. | No. | None compulsory. | I think not. | Not known. | Sulphate of iron at times. | No. |
| XX. | What is done with the night-soil? ... | It is the property of the contractors, who remove it to various districts from eleven to fifteen miles beyond the city of Melbourne, and there finds ready sale for it from agriculturalists. | The night-soil is taken by the contractors, and sold to farmers and gardeners, chiefly in the neighbourhood of Preston. | Carted away and buried. Locality not known. | Carted out of the city. | It becomes the property of the contractor, and is removed from the district. | Carted to farms of contractor and others in Moorabbin, and ploughed in. | Trenched into the ground near the river. | Trenched in 2 feet 6 inches deep on land out of the town away from population. | Carted away from the town. | Carted out of the district. | Taken out of the town. I do not know where it is taken to. | Carted to various depôts outside the borough. | Disposed of upon a farm about four miles out of town. | Contractor disposes, outside the borough. | Carted on farms for manure. | Sold to the market gardeners in Oakleigh and Mulgrave. | Carted away. | Buried. |
| XXI. | What is the cost per ratepayer of the night-soil system adopted? | 16s. 1d. per annum; or 3s. 3d. per head of population. For 1887 it was 11s. 1d. per ratepayer. | About 11s. per ratepayer. | Scale of charges herewith. | Paid for by the Council out of the general revenue; £5,896 to be paid for this year, 1888-9, by contracts. | The cost to the city is about 17s. 6d. per pan; to the ratepayers, 12s. | 10s. plus cost of pans; say, in all, 15s. | Ten shillings per pan per annum. | Not paid out of rates. Yearly contract price 10s. 6d. each pan—emptied once a week. | 10s. per annum. | 14s. 6d. per pan per annum. | £1 per annum per pan. | Now costing 11s. 10d. per tenement per annum. | About 4s. 6d. per annum. | 15s. a year for one pan once a week to those who have it done through council. | 12s. or 13s. per annum for each pan. | 18s. per year to those who have to pay for its removal; the majority use it for manuring their fields and gardens. | £1 per annum to those requiring services. | None adopted by the council at present. |
| XXII. | What are the duties of the Sanitary Inspector? | To see that no nuisance exists in the city which it is in the power of the local authority to remove. | Carrying out the provisions of the Public Health Acts in force, also city by-laws, assisting in collection of costs of construction of private lanes and pavements, and registration of dogs, and reporting to the city surveyor on neglect of night-pans and street-cleaning contractors. In the performance of these extra duties he is allowed an assistant at 50s. per week. | Service of all notices and orders made under the Health Act, food adulteration, and general inspection of the back yards and premises within the city. | Inspect cleansing, to take steps to have right-of-ways made, and to have all nuisances and defective drainage remedied, &c. | Has the night-soil contract under his care; inspects all cases of complaint under the contract, or of nuisance, and any case of contagious sickness reported; makes a house to house visitation when necessary, and generally attends to all matters of nuisance in yards or premises. Another officer follows up the scavengers to see that the contract is carried out. A third man detects persons offending against by-laws, sanitary and otherwise, and to prevent the deposit of offensive material by unauthorized persons. | To detect and suppress nuisances under control of the Board. See schedule annexed. | The inspector of nuisances has to inspect and report upon all cases of nuisances brought under his notice or otherwise ascertained by him, and where duly authorized to take action against offenders. | To see that the town is kept in a cleanly condition, prosecute offenders against by-laws, &c. | Generally to enforce the provisions of the Health Act and the Local Government Act. | To carry out the provisions of the Health Act and by-laws made thereunder. There are three inspectors. | To report on places found to be insanitary, and prosecute where necessary. To serve notices requiring passages, &c., to be constructed. | Supervise the carrying out of contract for night-soil, investigate all complaints of nuisances, serve all notices under Health Act 782, and conduct all prosecutions under by-laws. | He acts as Inspector of Nuisances, Slaughter-yards, and also for the Local Board of Health. | To exercise a general supervision of the borough, and to serve all notices for construction of private streets and lanes, and to generally carry out the provisions of the Act and by-laws. | General supervision of the district. | The ordinary duties of Inspector of Nuisances, dairies and milk trades. | To see that no nuisance exists, and to carry out the provisions of by-laws. | Inspectors of nuisances and slaughter-yards, as laid down in the Health Act and Abattoirs Statute; there are three in the shire. |
| XXIII. | (a) What is his salary? (b) Does he combine other offices with that of Sanitary Inspector? (c) If so, what? | (a) His salary is £250 per annum; and he has two assistants, one paid at the rate of £156, and the other £180, per annum. (b) They perform no other duty. | (a) £200 per annum. (c) For (b) and (c), vide No. XXII. | (a) £176 per annum. (b) No. | (a) £208 per annum. (b) Yes. (c) Assistant Building Surveyor. | (a) £200 per annum. (c) Yes; Inspector of Weights, &c. | (a) £250. (b) No. | (a) Salary £52 per annum. (b) Yes. (c) He is sergeant of police. | (a) £180 per annum. (b) Dog Inspector and Inspector of Weights and Measures and Abattoirs. | (a) £30 per annum. (b) Yes. (c) Sergeant of Police. | (a) £160, £150, and £140. (b) Yes. (c) Rate collector and valuer. | (a) £150 per year and an allowance of 10s. per week for use of horse. (b) Yes. (c) Inspector of lamps and hall-keeper. The one salary covers all these offices. | (a) £125 per annum. (b) Yes. (c) Dog Inspector. | (a) £50 per year, with half of all fines recovered by him, also slaughtering fees. (b) No. | (a) £30 per annum. (b) Yes. (c) He is a member of the police force. | (a) £12 per annum or £1 monthly. (b) No answer given. (c) Police. | (a) £2 per week. (b) Yes. (c) Weights and Measures, Dogs, Stray Cattle, &c. | (a) £25 per annum. (b) Yes. (c) Rate collector, and collector of statistics and dog register fees. | (a) Each, £15. (b) Yes. (c) Police constables. |
| XXIV. | What is the salary of the Health Officer? | £400 per annum. | £75 per annum. | £50 per annum. | £50 per annum. | £50 per annum. | £50. | £52 per annum. | £15 per annum; £1 1s. each for special reports. | £20 per annum. | £30 per annum. | £50. | £10 per annum. | £30 per annum. | £10 per annum. | £10 per annum. | £25 per annum. | £20. | £10. |
| XXV. | (a) What is the annual mortality per 1,000 inhabitants from zymotic diseases in the district, for the past five years? (b) In what part of the district do zymotic diseases chiefly prevail? | (a) 1887—1.23; 1886—1.12; 1885—0.716, including, in each case, persons treated in hospitals. (b) Not sufficient data to show. | (a) No answer given. (b) I have no returns from which I can supply this information. | No answer given. | (a) 1887, 5.14 per cent.; 1886, 7.2 per cent.; 1885, 4.4 per cent.; 1884, 11.6 per cent.; 1883, 5 per cent. (b) No particular locality. | (a) No answer given. (b) No answer given. | (a) These returns can only be compiled from books of Registrar-General. (b) No part is particularly subject to zymotic disease. | (a) About 3.5. (b) See health officer's letter of 28th ult., of which a copy is sent herewith. | Have no means of ascertaining this; the Government Statist might perhaps give it. | (a) No answer given. (b) The town has been and is remarkably free from such diseases. Annual statement forwarded to Central Board of Health. | (a) 1887, 3.48; 1886, 2.40; 1885, 2.40; 1884, 5; 1883, 0.14. (b) Unable to distinguish. | (a) 1887, 0.86; 1886, 1.3; 1885, 0.55; 1884, 0.85. (b) The eastern portion of the district. | (a) 1887, 1.16; 1886, 2.05; 1885, .96; 1884, 1.8; 1883, 2.8. (b) The diseases are general, and not prevalent in any particular part. | (a) 2.6. (b) No particular part. | (a) 1887, 20.57; 1886, 16; 1885, 24; 1883, 17. (b) No answer given. | (a) Do not know. (b) In the south part. | (a, b) This question cannot be answered. | (a) Not aware. (b) See registrar of deaths. | No answer given. |

SCHEDULE OF NOXIOUS TRADES IN METROPOLITAN AREA.

| Name of Licensee. | Address | Name of Trade. | Area of Ground. | Tenure and Value. | Character and Value of Buildings. | Nature and Value of Machinery. | Character of Drains. | Nature of Drainage. | Number of Hands Employed. | Output of Business. | Remarks. |
|------------------------------|-----------------------------|--|-------------------|---|--|--|---|--|--|---|---|
| Brundell, J. .. | Saltwater River, Footscray | Slaughter-house | .. | Leasehold; £9 per week | Cattle portion of stone; sheep portion of wood and iron; pitched floors; roof of iron | .. | Pitched to river .. | Blood and washings | Seventeen (17) .. | 120 cattle per week; 2,000 sheep | Inspected August 14, 1888. Dirty and untidy; all the drainage to the river; insufficient fall in the drains; no shelter for the cattle. (<i>Vi</i> de Reports on abattoirs.) |
| Dundas, F. A. . . | Saltwater River, Footscray | Slaughter-house | 4 acres | Rented from Co-operative Tallow Company | Stone .. | £1,850 | Pitched, and well sloped, to carry off drainage to catch-pits | Blood and washings | Thirty-six (36) .. | 170,449 sheep; 7,622 cattle; 6,140 pigs, from Sept. 1, 1887, to Aug. 31, 1888 | Inspected August 14, 1888. (<i>Vi</i> de Reports on abattoirs.) |
| Greenham, W. . . | Braybrook .. | Slaughter-yard | .. | .. | Wood, pitched floor | .. | Wooden shoot to Saltwater River | Blood and washings of floors, &c. | .. | 10 cattle per week .. | Inspected November 13, 1888. Place untidy and dirty; pigs wandering about eating blood; all blood and drainage straight to river. |
| Morgan, David | Abattoirs, Williamstown | Abattoirs .. | 8 acres 2 perches | Annual rental, £146 | Wood and iron; £300 | 1 wind, £10 | Bluestone .. | Water.. | Ten (10) .. | Last month's output, 2,280 sheep; 157 cattle; 17 calves; 45 pigs | Inspected July 5, 1888. (<i>Vi</i> de Reports on abattoirs.) |
| Pritchard, J. .. | Reilly-street, Collingwood | Slaughter-yard | 72 x 132 .. | Freehold, at about £8 per foot | Wooden; £500 | .. | Redgum .. | Washings of place | Ten (10) .. | 80,000 sheep and lambs annually | Inspected May 23, 1888. Blood collected in a pit, and carted to farms; water from washings to Reilly-street drain. (<i>Vi</i> de Reports on abattoirs) |
| Alexander, C. (now Richards) | Ramsden-st., Collingwood | Boiling-down establishment | .. | Leasehold .. | Wood, in bad repair; floors of brick | Boiler, vats | 6-inch pipe drain to catch-pits; then to Reilly-street drain | Condensed steam from vats; washings | .. | .. | Inspected May 23, 1888. Steam from vats taken to a condenser, and then to furnace over fire; smell of boiling down; yards untidy; sheds dilapidated. |
| Kennet, T. K. . . | Saltwater River, Kensington | Boiling-down works | 2½ acres | Annual rental, £25 | Wood, and iron roof; £300 | 25 b.p. boiler, and steam-tight vats | Bluestone pitchers | .. | Seven (7) .. | 250 weekly | Inspected May 14, 1888. Strong smell of boiling down; pigs kept; drains imperfectly laid; steam-pipe from vats taken to chimney, but not under the fire-bars. |
| Day, — | Braybrook .. | Boiling-down establishment and pigery | .. | .. | Wood, iron roof, pitched floor | .. | Earthen .. | .. | .. | 190 pigs kept; about 12 killed in a month | Inspected November 13, 1888. Clean; offal used to feed pigs. |
| Hutton, T. .. | Saltwater River, Kensington | Boiling-down establishment and slaughter-house | 30 ft. x 130 | Rented from City Corporation; £15 per annum | Wood; floors pitched; £100 | Vats and boilers; £300 | Stone pitchers, into Saltwater River | Soup from vats, water from pig-sties, and washings and blood | Three (3) .. | .. | Inspected April 24 and May 14, 1888. Odour of boiling down steam from vats lead into the furnace, but not under the fire-bars; pigs kept, and sues dirty. |
| Swan, Isaac .. | Saltwater River, Kensington | Boiling-down establishment | 51 ft. x 139 ft. | Leasehold; £15 annual rental | Boiling-down house, capable of being used as a room; 14 sties for 6 pigs each; all wood and iron; £150 | Steam boiler, 2 steam-tight vats, and 2 steam-tight pitchers, through fire to some waste steam for sanitary purposes; £170 | Pitched and cemented | .. | One (1) constantly; two (2) occasionally | 100 tons of tallow and 300 pigs annually | Inspected April 24 and May 14, 1888. Smell of boiling down; no pipes from vats to furnace; chimney very low. |
| Blyth, Irvine, and Binney | Bone Mills, Footscray | Bone mills .. | 2 acres | Freehold; £12,000 | Iron, brick, and wood; £5,000 | 3 steam boilers, 2 engines, vats, trucks, &c.; £5,000 | Wood; pipes; and pitched | .. | Forty (40) to sixty (60) | 300 tons of bone-dust; 700 tons of tallow; 10,000 gallons of oil | Inspected August 14, 1888. Efforts have been made to minimize offence, covers and pipes being provided to carry away waste steam; steam-pipes from vats taken to water tank, and thence to furnace; smell from drying products and too much stored in place; offensive smell perceptible at some distance from establishment. |

SCHEDULE OF NOXIOUS TRADES IN METROPOLITAN AREA—continued.

| Name of Licensee. | Address. | Name of Trade. | Area of Ground. | Tenure and Value. | Character and Value of Buildings. | Nature and Value of Machinery. | Character of Drains. | Nature of Drainage. | Number of Hands Employed. | Output of Business. | Remarks. |
|------------------------|---|-------------------------------------|-----------------------|--|---|--|--|---|--|---|--|
| Fitts, A. W. | Saltwater River, Kensington | Manure and glue works | About an acre | Freehold; £1,000 | Wood, floors paved; £2,000 | Boiler, vats, tanks, &c.; £3,500 | Underground pipe drains to a 'receive and overflow' tank at Saltwater River; drains offensive | Refuse water, and washings | Sixteen (16) | £15,000 | Inspected May 14, 1888. Place untidy; offensive smell; refuse from fleshing vat used for fuel; steam from vats taken to a condenser, not under furnace. |
| Cockbill, J. | Kensington-road, Footscray | Artificial manure works | 100 ft. x 114 ft. | Freehold; £6 per foot | Wood and iron pitched roofs; £1,000 | Boiler, vats, &c.; £1,300 | 2½-in. iron pipes underground to Saltwater River, along which drainage forced by a pump from a catch-pit | Soup from boiling-down; washings of floors | Nine (9) | 20 to 30 tons of manure per week; about £7,500 per annum | Inspected October 19, 1888. Clean; slight smell about boiling-down premises, and offensive smell in room where raw material received; escaping fumes condensed, and then taken under furnace; no storage of manure. |
| Cuning, Smith, and Co. | Whitehall-street, Yarraville | Chemical manufactory and bone mills | .. | Freehold | Brick, and wood floors, pitched | Vats, mills, &c. | .. | .. | .. | .. | Inspected October 19, 1888. Fairly clean, but there is decided offensive smell caused in the manufactories, especially in drying the vat refuse. Fumes from vats to a condenser, and then to stack; not much drainage, as waste products, gelatine, &c., utilized. |
| Brinton and Durham | River Bank, Kensington | Pellmongers and tanners | 3½ acres | Leasehold; rental equal to £50 per annum | Wood, brick, and galvanized iron additions; £3,000 | 2½ h.p. boiler, engine, &c., and wool-scouring and tanning plant; £2,500 | Surface and underground; stone, tile piping, and red-gum box drains | Lime water, soapy water, and spent tan liquor | Seventy-five (75) | £59,740 per annum.. | Inspected May 14, 1888. Floors wood or earth; drains choked; 2 small boiling-down vats; place untidy; skins &c., lying about; no particularly offensive smells. |
| Dale, J., and Co. | Atlas Works, Cremorne, Richmond | Pellmongery and tanning works | 4 acres | £20,000 | Mostly brick, small portion wood | Wool-scouring and tanning machinery; £2,000 | Underground; mostly of earthenware pipes | Water.. | Sixty (60) | 4,000 bales of wool, 600 bales of basil; £100,000 per annum | Inspected August 29, 1888. Smell from drying fleishings; rather untidy; no wool washed in river; all drainage to Yarra. |
| Gibb, D. and W. | Footscray | Pellmongery and tanuary | 2 acres | £5,000 | Stone and brick, iron and wood; £3,000 | Boilers, engine, wool-scouring machine, pump, &c.; £3,500 | Main drain brick; short drains into above, wooden | Waste water from scouring-machine | Forty (40) | 3,500 bales wool, 300 bales basil; £50,000 | Inspected August 23, 1888. Not working. |
| Murray, W., and Co. | Victoria-crescent, Collingwood | Pellmongers | 2 acres, more or less | Leasehold; £250 per annum | Brick, and wood sheds; £1,200 | Boiler, engine, wool-scouring machine, and steam-pump; £1,500 | Half, 5-in. clay pipe, half-open | Water from scouring-machine | Thirty (30) for six months of year, October to March | 3,000 bales wool, value about £15 per bale | Not working when visited. |
| Nettleton, A. H. | Victoria-street, Collingwood | Pellmongery | 2 acres | £5,000 | Stone, brick, wood, and iron; £5,000 | Wool-scouring plant and presses; £1,000 | Underground earthenware pipes and open drains | Waste water from scouring-machine | Twelve (12) | From £15,000 to £30,000 | Inspected August 29, 1888. The skins arrive from the hide-street, with heads and feet on, and very dirty and smeared with blood. The fleishings are dried on frames, and cause offence. Yarra polluted by drainage. |
| McFarland and Dale | Yarra-street, South Yarra (on river, near railway bridge) | Pellmongery | 4 acres | Leasehold | Wood, stone and brick, some of the floors asphalted, and some pitched | Engine and boiler, and plant for wool-washing | Main drain all earthenware, discharging into 'Arbraun' main drain; some of the waste water drains into the river | Soapy and lime water | Twenty (20) | .. | .. |
| Sarle, G. | Berlin-street, Richmond | Wool-scouring | ½ acre | Leasehold; £25 per annum | Wood and brick; £500 | Plant; £200 | Wooden | Scrap and yolk from wool | Nine (9) at present; twenty (20) when in full swing | £15,000 | .. |

| Vockler, Chas. | Vockler-street, Footscray | Glue factory | 14 acres; valued at £5,000 | Freehold | Galvanized-iron, stone, and brick building; stone and brick and earth floors | Vats and drying frames | Earthen open drains to Stony Creek | Waste from vats, and dirty water | Four (4) | 16 to 20 tons of glue a year | Inspected October 19, 1888. Not working; place clean now; drainage not intercepted, or treated in any way. |
|--------------------|---|--|------------------------------|---|--|--|---|--|---------------------------------|---|---|
| O'Neill, James. | Saltwater River, Kensington | Gut factory | 1/2 an acre | Rented from City Corporation; £25 per annum | Wood; floor brick, partly wood; £100 | Spinning wheel | Stone pitchers to Saltwater River | Contents of guts, and washings of place | Six (6) | £1,000 per annum | Inspected May 14, 1888. Slightly offensive; refuse accumulated under wood floor. River polluted by drainage. |
| Quinn, D. | Saltwater River, Kensington | Gut factory and boiling-down establishment | .. | Rented from City Corporation | Wood | Vats and boilers | Stone pitchers into main drain from pig-sties, and then into Saltwater River; pitchers badly laid, and fluid stagnant in drain, and offensive | Soup from vats, waste water from pig-sties, and contents of place, and contents of guts | .. | .. | Inspected April 24 and May 14, 1888. Offensive odour of boiling down over whole place; steam from vats taken by a pipe into the chimney, but not under the fire-bars; pigs kept. |
| White, J. K. | Saltwater River, Kensington | Gut factory | .. | Leasehold; £100 per annum | Wood and iron, and wood floor | .. | Hardwood channel, earthen, and very imperfect | Water from skins and guts | Fifteen to twenty (20) | £4,000 | Inspected May 14, 1888. Pelts washed in river; guts cleaned in vats, and all refuse into river; hells down refuse in a small vat, and then to furnace; clean water from furnace. Peculiar and offensive odour noticeable. |
| Box, C. and G. | Reilly-street, Collingwood | Hair curling | 1 1/2 acres | Freehold | Wood | Plant for washing hair, and drying and twisting into ropes | Pitched and pipe drains to catch-pit | Dirty water from washing hair | Ten (10) men and three (3) boys | .. | Inspected August 24, 1888. No offence; clean; disinfectants used. |
| Pring and Rankin | Moreland-road, Brunswick | Hair manufactory | .. | .. | Wood | For washing, teasing, and drying hair | Earthen | Washings from the hair | Five (5) | .. | Inspected August 22, 1888. Drainage bad; soaking into soil; no offensive smell from trade. |
| Whittingham Bros. | Macaulay-road, Flemington | Maizena factory | .. | Freehold | Wood; good cement floor | Boiler, mill, tanks, &c. | Covered drain to Moonee Ponds canal | Waste water | .. | .. | Inspected May 14, 1888. Clean and inoffensive; slight sour smell about. |
| Colonial Sugar Co. | Yarraville; offices 12 Queen-street, City | Sugar refinery | 4 1/2 acres | Freehold; £7,000 | Brick; £20,000 | Sugar-refining machinery; £70,000 | Cast iron; a few earthenware pipes | Surface and roof wash water from factory, water from Yarraville water-works for cooling purposes | 165 | 17,000 tons. | |
| Apollo Candle Co. | Port Melbourne | Soap and candle works | 6 acres | Freehold; £75,000 | Brick and wood; £10,000 | Plant, &c.; £35,000 | Pipes | Water for cooling purposes | 200 | .. | Inspected May 16, 1888. Arrangements to prevent offence, by taking all vapours from room by exhaust to furnace; settlement tanks for drainage imperfect, and cause offence. |
| Gilham and Co. | Hotham Soap Works, North Melbourne | Soap factory | 125 x 165 | £3,756 | Brick and wood; £600 | Steam-boiler, frames, &c.; £300 | Open pitched drains | Waste soap water | Four (4) | 3,000 boxes of soap | Inspected August 20, 1888. Do not boil down; place untidy; no catch-pit for drainage. |
| Hamilton, G. W. R. | Showers-street, South Preson | Soap factory | 1 acre | £3 5s. per foot | Galvanized iron; £250 | Plant, 3 18-gallon boilers, washing-tables, &c.; £50 | None | .. | Three (3) | Only new at business, and not properly started. | |
| Lewis and Whitty | Richmond | Soap and candle works | 236 x 411; about 2 1/2 acres | £6,000 | Stone, brick, and iron; £12,000 | Machinery and plant; £10,000 | Bricks, and earthenware pipes | Water used in washing starch | Sixty-three (63) | £70,000 | Inspected August 23, 1888. No boiling down; no offence; clean and tidy. |
| Sutherland, John | Brighton | Soap works | 2 acres | £5,000 | Wood and iron; £2,700 | Steam-boilers, soap-presses, soda pans, presses, moulds, &c.; £3,000 | Brick | .. | Seventeen (17) | 800 tons soap; 400 tons soda crystals. | |
| Tilley, A. | Surrey-road, South Yarra | Toilet-soap works | 33 x 184 | Freehold; £230 | Bluestone and brick, iron roof; £300 | Boilers, hand-embossing presses, dies, frames, &c.; £270 | Open brick, set in cement, and underground drain-pipes; the former for waste water from factory (boiling soap); the latter, roof water | .. | Five (5) | 50 tons toilet soap. | |

SCHEDULE OF NOXIOUS TRADES IN METROPOLITAN AREA—continued.

| Name of Licensee. | Address. | Name of Trade. | Area of Ground. | Tenure and Value. | Character and Value of Buildings. | Nature and Value of Machinery. | Character of Drains. | Nature of Drainage. | Number of Hands Employed. | Output of Business. | Remarks. |
|---------------------------------------|---------------------------------|---|--|-------------------------|--|--|---|---|---------------------------|------------------------------------|---|
| Walker, H. | Adlerley-street, West Melbourne | Soap and candle factory | About $\frac{1}{2}$ an acre | Freehold | Wood, brick and iron buildings | .. | 3-foot drains, to a catch-pit | Soap-lyes | Seven (7) | 10 tons of soap a week | Inspected August 20, 1888. Clean; no offence; raw fat is not boiled down; patent smoke-consumer is used. |
| Walker, H. | Victoria-street, Collingwood | Soap factory | 5 $\frac{1}{2}$ acres (1 acre occupied by factory) | Leasehold | Very old wood buildings; floors partly brick and partly wood | 3 boiling-down vats, 2 soap vats | Underground pipe-drains, leading to a catch-pit; then sieved through a sieve, and the water pumped into the garden or run into the Yarra | Waste - water, and soup from boiling-down | Fourteen (14) | 10 tons of soap per week | Inspected August 23, 1888. Noxious fumes from vats drawn out of vats, and taken under furnace; a good deal of offensive smell about, especially from the boiling-down of kitchen fat. |
| Waddell and Co. | Saltwater River, Kensington | Candle factory | 2 $\frac{1}{2}$ acres | Freehold | Substantial brick | .. | Pipe drain to catch-pit | .. | .. | 600 400-boxes candles per week | Stearine works well conducted, and not offensive. |
| Melbourne Co-operative Tallow Company | Saltwater River, Footscray | Tallow and manure works | 75 x 650 | Freehold; £2,500 | Wood and iron; asphaltic floors; £575 | 8 h.p. engine, Gallo-way boiler, bone mills, tallow vats; £350 | Open drains around premises; tile and earthenware from works under ground to river | Washings of place | Ten (10) | Tallow, £15,000; bone-dust, £5,000 | Inspected May 14, 1888. Pigs kept, and some of the sties badly floored; floors dirty; offensive smell from the refuse from the vats; steam-pipe from the vat taken to furnace. |
| Grimes, S. K. | Moreland-road, Brunswick | Bacon curer | 8 acres | £800 per acre | Stone, wood, brick; £2,000 | Freezing plant, &c.; £1,800 | Brick and cement | Water only | Eight (8) | 4,232 tons | Inspected August 24, 1888. Place clean and tidy; not offensive; collect fat from butchers, and send refuse to the bone-mills. |
| King, Smith, and Kemhan | East-street, Northcote | Bacon curers | .. | Freehold | Brick and wood; floors brick | .. | Blood and washings from slaughter-pen pass to a brick cemented pit; the other drainage through a number of small catch-pits, then by a pipe-drain to a small field sunk about 40 feet in the rock | Washings of place | .. | 300 pigs a week; 2 tons of lard | Inspected August 22, 1888. Very satisfactory, clean, tidy, well drained, and ventilated; burns offal in furnace; no offensive smell at all. |
| Rohead, J. | Moreland-road, Brunswick | Bacon-curer | .. | Freehold | Wood, iron roof, brick floors in slaughter-pen, rest pitched | .. | Pitched and pipe drains to a catch-pit, some into paddock, and some into drainage consisting of washings of place soaked into ground | .. | Four (4) | .. | Drainage unsatisfactory; blood buried in ground, and not properly covered over; offal is boiled down in a vat; the steam is not conducted under the furnace. |
| Gilbert, J. D. | Gilbert-road, Preston | Piggery | 20 acres | Freehold; £300 per acre | Wood and iron, and brick floors; £50 | Nil | Brick drains | Drainage from pig-sties | None. | .. | Inspected August 22, 1888. The blood from the killing is collected in a barrel, and carted away with the offal by farmers; place rather untidy; but business is about to be given up. |
| Hearn, H. | High-street, Preston | Piggery, and ham and bacon curing establishment | 15 acres | Leasehold | Wood, with brick floors; some brick; some asphalted floors; killing-places of wood, with bricked floor | Boiler, tanks, &c. | Open brick discharge into a paddock; blood caught in a catch-pit | Washings | Four (4) | 100 pigs a week | Inspected December 7, 1888. Fairly clean and tidy; blood ploughed in, and offal carted away. |

| | | | | | | | | | | | | |
|-------------------------------|---------------------------------------|-----------|-------------------------|--|---|--|---|--------------------------|----|-------------------------|----|--|
| Hutton, J. C. .. | Ham and Bacon Factory, Preston | 33 acres | Freehold; £27,000 | Brick, wood, and iron; floors cemented; £22,000 | Refrigerator, £1,000 Steam boiler 100 Sausage-engine 300 Digester for tallow 100 .. £1,500 | Brick and cement .. | Waste water .. | Thirty (30) | .. | £80,000 | .. | Inspected December 7, 1888. Well conducted; clean; boil down fresh offal; blood removed to a farm; catch-pit for drainage, which is treated with lime and alum; sties in good order. |
| Patterson, W. .. | Plenty-road, Preston | 3 acres | Freehold; £40 per foot | Wood; floors partly brick, partly earth; pig-sties wood; floors—some boarded, and some asphalted, killing-place of wood, with wood floor | Boiler, vats, tanks, &c. | Open; bricked and pitched, but uneven; drainage flows into street channel | Washings of place and drainage from sties | Eight (8) | .. | 170 pigs a week | .. | Inspected December 7, 1888. Very untidy and neglected; drains offensive; buildings old, and in bad repair; blood removed to farm. |
| Staples, G. .. | Preston | 6½ acres | Freehold; £300 per acre | Wood and iron; £100 | Steam boiler; £70 | Brick .. | Drainage from sties | Two (2). | .. | .. | .. | .. |
| Thompson, T. .. | Gilbert-road, Preston | 3 acres | Freehold; £300 per acre | Wood .. | Boiler, 2 h.p. | Brick .. | Drainage used as manure | .. | .. | No account kept. | .. | .. |
| Andrews, J. T. | Boundary-road, North Melbourne | 70 x 200 | Freehold; £1,000 | Wood; £300 | Leather-splitting machine, £120; general plant, £50 | Open drains | Tan liquor | Eight (8). | .. | £4,000. | .. | .. |
| Barry Bros. .. | Mary-street, Preston | ½ acre | Freehold | Wood, and earth floor | Boiler, pump, pits | Open brick | Waste water from pits | Six (6) | .. | .. | .. | Inspected December 7, 1888. Uses fowl dung bate; water from soaks treated with alum and filtered; fleshings removed weekly. |
| Braithwaite, W. | Murray-road, Preston | 196 x 165 | £1,000 .. | Wood and iron; £500 | Engine, boiler, stock-ing machine, agitators, pump, bark mill, &c.; £900 | Surface drains; brick or red-gum under ground, made of white-gum sides and red-gum top and bottom | Principally lime water | Twenty (20) | .. | £11,000 | .. | Inspected December 7, 1888. Well-conducted, but attempts to precipitate the drainage in large pits not very satisfactory. |
| Broadhurst, J... | High-street, Preston | ½ acre | Freehold; £300 per acre | Wood and iron; £343 | Boiler, engine, pumps, &c.; £600 | Open brick to street channel; catch-pit for drainage, where it is treated with alum and chloride of lime | Waste water from pits | Eighteen (18) | .. | 150 hides a week | .. | Inspected December 7, 1888. A new place; not yet finished. |
| Clark, D. G. .. | Clark-street, Richmond | .. | Freehold | Stone, brick, and wood; building very substantially built | .. | Pitched, to a settling tank | Waste water from lime and soak pits and spent tan | .. | .. | 120 hides a week | .. | Inspected August 24, 1888. Clean and tidy; fleshings kept in casks, and frequently removed; American tanning bate used. Refused to supply information as to value, &c. |
| Debnay Bros. .. | Mount Alexander-road, Richmond | 1 acre | Freehold; £1,000 | Wood; £600 | 10 h.p. engine, bark mill, splitting machine, &c. .. £1,300 tan pits .. 500 .. £1,800 | Wood .. | Tan liquor and lime water | Thirty (30) | .. | £25,000 | .. | Inspected May 17, 1888. Drainage bad; a drain in yard, a devious earthen channel, almost choked; fleshings accumulated; uses patent bate; floors earthen; place untidy. |
| Donald, and Sons | River-street, Footscray | ½ acre | Freehold | Wood, galvanized iron roof, earthen floor | Tan and lime pits, &c. | Earthen open drains, and drainage soaking into soil | Water from lime and soak pits | Five (5) | .. | 50 hides per week | .. | Inspected October 19, 1888. Place untidy; fleshings accumulated on a wood platform, under which drainage collected; want of drains. |
| Fahey, Richard-son, and Abson | Reilly-street, Collingwood | ½ acre | Freehold | Wood .. | .. | Underground pipe drains straight to Reilly-street drain | Waste water from lime and soak pits | Five (5) | .. | 40 to 50 hides per week | .. | Inspected August 24, 1888. Use fowl dung bate; waste lime used for filling in ground; fairly tidy; fleshings allowed to accumulate rather too long—eighteen days. |
| Farrell, Rose .. | Colonial Tannery, Clark-st., Richmond | .. | Freehold | Brick and wood | .. | Earthen .. | Waste water | Eight (8) in curing shed | .. | .. | .. | Inspected August 24, 1888. No tanning carried on now; drains unmade, and contents stagnant. |

SCHEDULE OF NOXIOUS TRADES IN METROPOLITAN AREA—continued.

| Name of Licensee. | Address. | Name of Trade. | Area of Ground. | Tenure and Value. | Character and Value of Buildings. | Nature and Value of Machinery. | Character of Drains. | Nature of Drainage. | Number of Hands Employed. | Output of Business. | Remarks. |
|-------------------------------|-----------------------------------|----------------|------------------|--|--|---|--|---|---------------------------|--|---|
| Gill and Boston | River-street, Richmond | Tannery | .. | Leasehold .. | Stone, brick, and wood | Boiling-down plant; fourteen tan pits | Earthen, to River Yarra; neglected, so that contents soak into soil | Contents of soak and lime pits; soup from boiling-down of hides; tannage plugs from hides | Sixteen (16) | 24 hides per week .. | Inspected August 24, 1888. Grease from leather kept in old tins, and offensive; only make sole leather; no bade used; fleshings boiled down or steamed in an open vat; yard untidy; heaps of hair, ears, and skin lying about; grease from a fowl yard into lower yard of tannery; refuse used for filling. |
| Glasgow, A. .. | Alfred-street, North Melbourne | Tannery | 1 acre .. | Leasehold, £30 per annum; £1000 | Wood; £60 | Plant, &c.; £150 | Formed drain .. | Lime water .. | Four (4) .. | 1,600 hides annually | Inspected May 17, 1888. Well conducted; disinfectants used for drainage; boils down fleshings. |
| Hardeman, P. .. | High-street, Preston | Tannery | 250 ft. frontage | Freehold .. | Wood and iron | Boiler, engine, pump, pits, &c. | Open brick to street channel | | Twenty (20) | 500 hides per week .. | Inspected December 7, 1888. Untidy; uses fowl dung bade, and runs it through a filter before draining it away; dries fleshings on frames in the yard, and hales them. |
| Hunt, A. .. | Sutton-street, North Melbourne | Tannery | 150 x 186 .. | £900, freehold; leasehold, £1 per week | Wood; £100 | Boiler, £40; vats, £24; tan pits, tables, &c. | Brick .. | Waste tan liquor and lime water | Four (4) .. | 2,500 hides .. | Inspected May 17, 1888. Drains into a swamp; fleshings allowed to accumulate. |
| Kenson, J., and Sons | River-street, Richmond | Tannery | 1½ acres .. | Freehold .. | Wood and galvanized iron; earthen floor; 8 tan-pits; 1 soak and 2 lime | | Earthen .. | Contents of soak and lime pits | Twenty (20) | About 960 skins a week | Inspected August 24, 1888. Untidy; drainage bad; uses ben-dung bade in winter, and an American composition bade in summer; the fleshings, refuse lime and hair mixed and removed by nurserymen for manure; heap of refuse on ground; grease from leather kept in old tins, and offensive. |
| Kepert, L. G. .. | Moreland-street, Footscray | Tannery | 100 x 100 .. | Freehold; £1,200 | Wood and iron; £400 | Plant; £150 | Bluestone and brick | Waste tan and lime water | Four (4) .. | £1,500 .. | Inspected October 19, 1888. Untidy; fleshings and refuse collected for months; uses fowl dung for bade. |
| Lambert, James | Gowerville Tannery, Preston | Tannery | 5 acres .. | £500 per acre, at a yearly rental of £70 | Wood; £300 | Barl mill and splitting machine; £200 | Surface, over five acres | Spent tan water | Eight (8) to ten (10) | About 60 hides per week, more or less. | |
| Lilburne, David | Crown-street, Richmond | Tannery | 40 x 114 .. | Freehold; £120 | Wood; £30 | Tools, &c.; £15 | Stone and earthenware pipes | | Two (2) .. | 400 hides, 140 calf-skins. | |
| Madsen, M. .. | High-street, Preston | Tannery | 9 acres .. | Leasehold .. | Wood and galvanized iron; floors of earth | Boiler, engine, pumps, pits, &c. | Pipe drains to an open pitched drain, which soon becomes a mere earthen channel | Waste water from pits | Ten (10) .. | 120 hides a week .. | Inspected December 7, 1888. Rather untidy; uses fowl-dung bade. |
| Marshall and Noden | Burnley-street, Richmond | Tannery | 150 x 200 x 66 | Freehold .. | Wood .. | Usual tan, soak, and lime pits | Underground pipe drains and sewers | Waste water from soak and lime pits; spent tan soaks into ground a good deal | Twenty (20) | 300 skins a week; 50 hides | Inspected August 23, 1888. Use a patent bade; drainage treated with carbolic acid; place rather untidy. |
| McKay and Russell | Rooney and Rose streets, Richmond | Tannery | 50 x 280 .. | Leasehold; £100 per annum | Wood and iron; £300 | Nil .. | Earthenware pipes | | Five (5) .. | 2,250 hides. | |
| McMillan, J. | Buckingham street, Richmond | Tannery | 35 x 144 .. | Freehold; £250 | Wood, and iron roof; £60 | | Tile .. | Tan liquor .. | Self and son .. | Between £500 and £600. | |
| Michaelis, Hal-lenstein & Co. | Hopkins-street, Footscray | Tannery | 3 acres .. | Freehold .. | Brick .. | Tan pits, &c. | Bricked and pitched drains to a brick catch-pit, and then brick open drains to river | Water from soak and lime pits, and washings of tan pits, &c. | Fifty (50) | | Inspected October 14, 1888. Yards have an untidy look from fleshings hanging on frames to dry. |

| | | | | | | | | | | | |
|-----------------------|-------------------------------------|---------|---------------|--------------------------------|--|---|--|--|------------------------|---|--|
| Moffatt, Isaac .. | Lambeth-street, Kensington | Tannery | 42½ x 77 .. | £10 per foot .. | Wood; about £120 | Vats and bark-mill; £50 | None, on account of council filling up low-lying roads | .. | Three (3) besides self | £2,000. | Inspected August 24, 1888. Drainage from dwelling-house passes over roof; uses fowl-dung bate; fleshings kept in pits; soak pits of wood, and offensive; drains badly laid and choked; place untidy. |
| Rentoul, John | River-street, Richmond | Tannery | 30 x 250 .. | Freehold; £450 | Wood; £150 | Tan-pits, tables, &c.; £100 | Metal drains | Spent tan liquor and lime water | Seven (7) | 20 hides and 8 doz. calf skins per week | Inspected August 20, 1888. In good order; no offence noticed; no bate used. |
| Reynolds, S. P. | Macaulay-street, North Melbourne | Tannery | ½ acre .. | Leasehold | Wood, galvanized-iron roof | .. | Pipe drains to two sets of pits of brick and cement; contents of drain forced into by steam overflow to street | Water from soak and lime pits | Twenty-two (22) | 120 hides per week .. | Inspected August 22, 1888. Untidy and dirty; yard muddy; fleshings accumulated; drainage bad; uses ben dung for bate; offensive smell. |
| Rich, Edward .. | Miller-street, Fitzroy | Tannery | .. | Leasehold | Wood; pits of brick; 20 tan pits, 5 lime, 2 soak, 2 bate | .. | Earthen channels drain, with insufficient fall, and contents overflowing and soaking into ground; one drain from tan pits blocked up | Water from soak, lime, and bate pits | Sixteen (16) | .. | Inspected August 20, 1888. No bate used; well conducted, except a heap of lime from pits outside the fence, and drainage from this soaking into the ground. |
| Richards, W. .. | Weston-street, Brunswick | Tannery | 50 x 137 .. | £25 per annum | Wood; £50 | None; plant, £50 .. | Wood and stone | Water and lime | Three (3) | 30 dozen per week. | Inspected May 17, 1888. Offensive smell from a heap of accumulated fleshings. |
| Rooney and Sons | Berlin and Rooney streets, Richmond | Tannery | ½ acre .. | £2,000 | Wood and iron; brick and cement pits; £3,000 | Boiler, engine, roller bark mill, crushing fittings, &c.; £200. | Earthenware pipes.. | Tan and lime water, and salt water soaked from hides | Eight (8) | 8,000 to 80,000 hides a year. | Inspected August 20, 1888. No bate used; earthen floors. |
| Smith, J. J. & Co. | Reilly-street, Collingwood | Tannery | 146 x 237 .. | Freehold; £2,950 | Brick, wood, and iron; pits, brick and cement; £2,750 | 10 h.p. engine and boiler; leather roller, bark cutting, and grinding mill; steam pump; £319 15s. | Brick and earthenware pipes | Lime water, used tan liquor, and salt water | Six (6) | About 5,000 hides; £5,000. | Inspected August 20, 1888. No bate used; well conducted, except a heap of lime from pits outside the fence, and drainage from this soaking into the ground. |
| Smith, S. .. | Alfred-street, North Melbourne | Tannery | 1½ acres .. | Freehold | Wood and brick and iron roof | Bark mill, &c.; lathes, buildings, and machinery, valued at £10,300 | Brick and asphalt; discharge into Moonee Ponds Creek | Lime water and spent tan liquor | Twenty (20) | 120 hides a week .. | Inspected August 20, 1888. No bate used; earthen floors. |
| Spence, Henry .. | Pitt-street, Flemington | Tannery | .. | Freehold; £5,000 | Wood; £300 | Bark mill and plant; £1,000 | Wooden | Mostly lime water; and soaks from fresh hides | Sixteen (16) | About 5,000 hides; £5,000 | Inspected August 20, 1888. No bate used; well conducted, except a heap of lime from pits outside the fence, and drainage from this soaking into the ground. |
| Steel, J. C. .. | Kensington Tannery, North Melbourne | Tannery | About 2 acres | Freehold; £16,000 | All wood; pits of brick and cement; £3,000 | Cornish boiler, 12 in. cylinder engine, 2 bark-mills, 2 leather rollers, &c.; £2,000 | Pitched and earthenware pipes, 9 in. | Water hides soaked in, and lime water, about 3 tons of lime goes through in week | Twenty-five (25) | £40,000 | Inspected August 20, 1888. No bate used; well conducted, except a heap of lime from pits outside the fence, and drainage from this soaking into the ground. |
| Wilde, J. R., and Co. | Abbotsford .. | Tannery | 131 x 165 .. | Freehold and leasehold; £2,715 | Brick and cement pits, stone and brick foundations, wood walls and iron roof; £2,120 | Engine, boiler, leather roller, pumps; £750 | Surface, brick; underground, earthenware pipes | .. | Forty (40) | £550 to £1,000 per month. | Inspected August 20, 1888. No bate used; well conducted, except a heap of lime from pits outside the fence, and drainage from this soaking into the ground. |
| Williamson, C. and J. | Fleetwood Tannery, East Richmond | Tannery | 52 x 260 .. | Freehold; £780 | Wood and iron; £300 | Splitting machine, bark-mill and pumps .. £450 tan pits .. 300 | Earthenware | .. | Five (5). | £950 | Inspected August 20, 1888. No bate used; well conducted, except a heap of lime from pits outside the fence, and drainage from this soaking into the ground. |

APPENDIX C.

INFORMATION REGARDING SEWAGE OF CITIES, COMPILED BY MR. CRAWFORD BARLOW.

SUMMARY.

| Name of Place. | Population. | Sewage per Head per Day. | Disposal. | Area of Land. | Population to Acre. | Whether Pumped. | Height. |
|-----------------------|-------------|--------------------------|---------------|---------------|---------------------|-----------------|---------|
| Adelaide | 65,000 | 45 | Land | 480 | 135 | gravitates ... | ... |
| Berlin | 1,200,000 | 22 | " | 5,374 | 112 | pumped ... | ... |
| Boston | 363,000 | 63 | Sea | ... | ... | " ... | 48 |
| Breslau | 300,000 | 25 | Land | 1,976 | 152 | " ... | 26 |
| Blackburn | 104,000 | 27 | " | 500 | 208 | " ... | ... |
| Edinburgh | 228,000 | ... | " | ... | ... | gravitates ... | ... |
| Frankfort-on-the-Main | 154,500 | 36 | " | ... | ... | " ... | ... |
| Hamburg | 305,000 | 39 | " | ... | ... | " ... | ... |
| London | 4,000,000 | 30 | River | ... | ... | 30 % gravitates | ... |
| Paris | 2,345,000 | 25 | { 1/6* " Land | ... | ... | 70 % pumped ... | 38 |
| | | | | 914 | 427† | gravitates ... | ... |
| | | | | | | pumped ... | ... |

Average amount of sewage per head per day = 31·2 gallons.

ADELAIDE.

Population—about 65,000.

Amount of sewage—45 gallons per head per day.

Area of district drained—480 acres.

Method of disposal—Broad irrigation, supplemented by intermittent downward filtration during wet season.

Area of irrigated land—480 acres; equals 135 persons to one acre; pasture land is let for £10 per acre.

BERLIN.

Population—1,200,000.

Sewage—22 gallons per head per day.

Method of disposal—Land irrigation.

Area of land—5374·5 acres. Experience up to 1883 shows proportion of land to population is 112 persons to one acre.

Pumping sewage—All the sewage is pumped on to the irrigation areas.

BOSTON.

Population—363,000. Sewage is provided for 600,000.

Amount of sewage—63 gallons per head per day.

Area of district drained—58 square miles.

Method of disposal—Put into the sea, after solid matter is removed by screens.

Pumping—All the sewage is pumped up 43 feet.

BRESLAU.

Population—300,000.

Sewage per head per day—25 gallons.

Method of disposal—Land irrigation.

Area of land—1,976 acres.

Pumping sewage—All the sewage is pumped up a height of 26 feet.

* Of 60,000,000 gallons, 10,000,000 gallons only is used for irrigation.

† This high figure is the result of the solid matter being collected in cesspools.

Notwithstanding the use of these meadows for 300 years, there has been no clogging, no saturation, nor has there been any complaint of unwholesome exhalations on the part of persons living in the vicinity.

DONCASTER.

Pumping—Sewage is all lifted a height of 52 feet.

EDINBURGH.

Method of Disposal.—Partly irrigation on the Craigtinnny meadows. Dr. Voeleker says, that notwithstanding the enormous volumes of sewage, which in the course of many (over 100) years have been poured on these meadows, the land contained only a little above $1\frac{1}{2}$ per cent. of organic matter, and, practically, merely traces of accumulated nitrogen. The net income, after the payment of all expenses, amounted to more than £29 per acre.

HAMBURG.

Note.—This is what the sewers are calculated for.

FRANKFORT-ON-THE-MAIN.

Amount of sewage—36.7 gallons per head per day (calculated).

LONDON.

Gradients of out-falls, 2 feet in a mile; flattest gradient, 1 in 3,520.

LONDON.

METROPOLITAN SEWERAGE.

1854.—The General Board of Health brought forward a scheme for draining London on "the separate system," but the Government of the day did not agree to this.

* The maximum amount of sewage delivered was in 1881, when 177,000,000 gallons per day average was reached. The capacity of the sewers is 420,000,000 gallons.

1855.—The Government finding that the Consolidated Commissioners of Sewers were an inefficient body for dealing with the question, brought forward an “Act for the better Local Management of the Metropolis,” and this was passed August 1855. The object of this Act was—

1st. To create a number of Local Boards to generally control public structural matters in each district, except the main sewer.

2nd. To form a corporate body, called the Metropolitan Board of Works, whose function is to control the district boards, and to take charge of the main sewers of London.

1855–6.—Various designs for dealing with the sewage were prepared, and on December (1856) the first Commissioner appointed three referees, Captain Douglas Galton, Messrs. Simpson and Blackwell, to consider all the designs.

1858.—As there was a difference of opinion between the Metropolitan Board’s Scheme and the referees’ opinions, Messrs. Bidder, Hawkesley, and Bazalgette were asked to report generally on the subject.

1858, August 2.—An Act was passed to amend the Metropolitan Local Management Act of 1855, and borrowing powers were given to the Board to the extent of £3,000,000.

Immediately after the passing of this Act the Metropolitan Board prepared plans and let the contracts, and in 1865 the main drainage works were completed, and opened by the Prince of Wales.

1858–62.—During the construction of the out-fall works, the Metropolitan Board of Works invited proposals for dealing with the sewage.

1862.—A Select Committee report on the utilisation of the sewage.

1864.—A second Committee was appointed to inquire into the same subject.

1865.—A Bill was passed to enable a private company to reclaim land and utilise the sewage, but this came to nothing.

PARIS.

Population—2,345,000.

Amount of sewage—25 gallons per day per head.

Method of disposal—Solid matter collected in cesspools, and liquid pumped partly ($\frac{1}{5}$ th) on land.

Area of irrigated land—914 acres. $\frac{2,345,000}{6} = 390,833$, number of people to land; equals 427 people to *one* acre.

Pumping—Sewage used for irrigation is pumped.

Value of the irrigated land—Land of 3rd class, worth £40 per acre, sold for £90 after irrigation. It is estimated that the advance in value of the land averages not less than £3 to £3 10s. per acre per annum.

APPENDIX D.

COPY OF ANALYSIS OF EFFLUENT WATER FROM ADELAIDE SEWAGE FARM, AND REPORT ON SAME.

SIR,

University of Adelaide, September 4th, 1886.

The following are the results of the analysis of the two samples of effluent water from the Sewage Farm :—

| Description. | Total Solids. | Free Ammonia. | Albuminoid Ammonia. | Nitrogen as Nitrates and Nitrites. | Oxygen consumed |
|---|---------------|---------------|---------------------|------------------------------------|-----------------|
| Effluent water at notch weir, taken at 4.20 p.m., August 19th, 1886; flowing at the rate of about 1,840,000 gallons in 24 hours. Heavy rains on the 17th and 18th ... | 177.64 | 0.8 | 0.14 | 0.36 | 0.25 |
| Effluent water taken at notch weir, at 3.55 p.m., August 24th, 1886; flowing at rate of about 1,540,000 gallons in 24 hours. Scarcely any rain for two or three days previous ... | 247.8 | 0.41 | 0.05 | 1.18 | 0.18 |

The figures express parts per 100,000.

I have been unable to find any published analyses of effluent water from sewage farms with which to compare the above results; but I may state that, according to a large number of analyses, sewage usually contains from about 4.5 to 5.5 parts of free ammonia per 100,000, and either no nitrogen as nitrates and nitrites or mere traces.

These numbers will serve to show that, in this case, though the water is still very impure, a very considerable purification has been effected.

The presence of large quantities of nitrogen as nitrates and nitrites, as against mere traces in sewage, only shows that a great part of the nitrogenous matter has been oxydized and, to that extent, destroyed.

The sample taken on the 24th, when the water was flowing at a slower rate, there having been scarcely any rain on the days immediately preceding, shows less ammonia but more nitrogen as nitrates and nitrites, indicating, as might have been expected, a more effective oxidation, and this is borne out by the smaller amount of oxygen consumed.

I am, Sir,

Your obedient servant,

(Signed)

EDWARD H. RENNIE.

The Hydraulic Engineer.

APPENDIX E.

ADELAIDE SEWERAGE.

GRADIENTS OF EACH SECTION OF THE MAIN INTERCEPTING SEWER.

| | | | | | |
|-----|--|-----|-----|-----|---------|
| 1. | 12 inch diameter glazed earthenware pipe | ... | ... | ... | 1 in 32 |
| 2. | 21 " " " " " " | ... | ... | ... | 1 " 450 |
| 3. | 24 " " " " " " | ... | ... | ... | 1 " 750 |
| 4. | 24 " " " " " " | ... | ... | ... | 1 " 450 |
| 5. | 15 " " " " " " | ... | ... | ... | 1 " 39 |
| 6. | 18 " " " " " " | ... | ... | ... | 1 " 61 |
| 7. | 2' 4" x 3' 6" concrete sewer | ... | ... | ... | 1 " 600 |
| 8. | 2' 8" x 4' 0" " " " " | ... | ... | ... | 1 " 600 |
| 9. | 2' 8" x 4' 0" " " " " | ... | ... | ... | 1 " 450 |
| 10. | 3' 4" x 5' 0" " " " " | ... | ... | ... | 1 " 450 |

Section 4 receives more sewage than is delivered into it from section 3, and, although the size of the pipe is not increased, the quicker gradient given to it enables it to discharge the larger quantity without choking or other difficulty; this applies also to sections 5 and 9.

R. L. MESTAYER,
Hydraulic Engineer.

Adelaide, 31st May, 1888.

APPENDIX F.

STATEMENT OF COST OF CLOSET CONNEXIONS IN ADELAIDE.

Town Hall, Adelaide,
12th March, 1889.

DEAR SIR,

I am in receipt of your favour of the 27th February last, in which you ask for an authoritative statement as to the cost of the closet connexions with the main sewer and what arrangements are made with householders who wish to have water-closets in their houses connected with the deep drainage.

In reply, I have the honour to say that the cost of the work in providing closet pans, cisterns, and laying pipe drain from the closet to the street building line varies, as the distance from the closet to the main sewer increases or decreases in length. The average cost is as near as possible twelve pounds (£12). In small cottage property, where the distance from the street building line is short the cost decreases correspondingly, but we are not aware of any connexions having been made between the closet and the sewer at a less cost than eight pounds (£8).

Where the owner of cottage property is too poor to pay the cost of connexion the Government do the work under the authority of an "Act to amend the Sewers Act," being Act No. 303 of 1883-4, authorizing deferred payment for such work (see section 4) at the price paid, interest to be paid at the rate of six pounds per centum per annum. The rate of interest has, however, been reduced to five pounds per centum per annum (see section 2 of Act 369), and the time for repayment of the cost incurred by the Government extended to six years in lieu of three years.

I have the honour to be, Sir,
Your obedient Servant,

THOMAS WORSNOP,
Town Clerk.

G. A. Syme, Esq., M.B.,
Secretary Royal Sanitary Commission,
Victoria.

APPENDIX G.

MEMORANDUM FROM MR. W. C. BENNETT.

Furnishing the amount of rateable property represented by the members of the Sydney Board of Water Supply and Sewerage elected by the aldermen of the city of Sydney and the aldermen of the suburban municipalities respectively, the figures being supplied by Mr. Coghlan, the Government Statist of New South Wales :—

| | Capital value. | Annual value. |
|----------------------------------|----------------|---------------|
| The city | £42,529,525. | £2,131,026. |
| Suburbs named in 51 Vict. No. 28 | £32,628,432. | £2,264,152. |

- The city aldermen elect two members.
- The suburban aldermen elect two members.
- The Government appoint two members (both the engineers for Sewerage and Water Supply).
- The Government also appoint the president.

APPENDIX H.

MODE OF CONNECTING HOUSES WITH SEWERS IN SYDNEY.

Sir,

Tremayne, North Shore, June 26th, 1888.

In performance of my promise to supplement the evidence given by me to the Commissioners while in Sydney, I beg to forward the lithograph* referred to therein, exhibiting my method of making connection between the sewer and the dwelling; and, although this instance is of the humbler class of tenement, the principle is the same, so far as intercepting the sewer gas between the sewer and the house, for all classes.

There is nothing claiming to be original or even novel in the whole contrivance; it is simply the plan that, after nearly ten years' experience in Sydney, I have found to be effectual without unduly heavy first cost.

As I stated in my evidence, the ventilation of the sewer appliances are only adopted at the option of owners of premises, the Act of 1879 not having contemplated the application of ventilation, nor yet that of 1881; but a supplementary Act is now under the consideration of Parliament, in which a clause is inserted making it competent for the Sewerage Board to attach the pipes for the purpose to any house, front or back, as the case may require.

The operation of connecting the house with the sewer is conducted in the following manner:—

After conforming to all formalities of application for permission to connect and other legal procedures, &c., the actual operation is after the following manner:—

The ground is opened in accordance with directions given by the Engineer, and to such depths as will secure a uniform and efficient fall; the bottom is rendered even and firm to the grade determined on.

The pipes are then laid at a uniform grade (determined from considerations of the local circumstance by the officer who is sent to make a survey of the premises), well bedded, and then thoroughly jointed carefully all round the socket, and carefully rendered internally, so as to leave an uninterrupted smooth surface for the flow of the sewage.

The pipes are to be perfectly smooth inside and cylindrical, and to be throughout their substance burnt to vitrification, and of such clay as will vitrify to stoneware.

In the case of a pipe having to pass under the floor of the house from front to back, or as on the lithograph, there will be inserted a disconnector trap similar to or on the same principle as that on the litho. (some good traps are illustrated in Mr. Oswald Brown's book on the Adelaide system). The one on the sketch is a Buchan trap, and has been found excellent in practice.

Under the floor, the pipe is jointed as above, and also packed around with 6 inches of concrete.

The rain-water pipe should not be used as a ventilator pipe, but discharge over the D trap in the manner shown on sketch. The ventilator may be a continuation of the soil pipe at the back.

The sewer-gas shaft is fixed on the front wall, and conveys the sewer gas from the outlet on the sewer side of the water trap, and discharges it above the ridge as shown.

These appliances are only fitted to the loftier buildings, as, if applied to low buildings, the gas escaping from the pipe would possibly discharge into some opening of a neighbouring house.

Another ventilator is fixed at the back, the function of which is to ventilate the pipe under the house, by drawing the air through it, which will be let in at A.

As to the most desirable system of sewerage for a populous city, I am strongly of opinion that the water-carriage separate system is by far the most preferable.

In Sydney, both systems, viz., the combined and the separate systems, are to be seen in operation.

A system of sewerage by the water carriage has been in use from very early days in Sydney; as soon as the Tank Stream (the little watercourse or rivulet upon the banks of which Sydney was first established) was disused as a source of water supply, and was arched over as a storm-water channel, the houses on its banks, and some at a considerable distance from its banks, laid drains connecting their house refuse and night-soil into it.

These early drains were laid with very little reference to sanitary conditions; therefore it happens that some of the oldest houses, though holding a high place as respectable dwellings, are sometimes found to be worse ventilated than a modern cottage.

In those days, all branches were made of liberal dimensions, sufficient to convey storm water as well as sewage.

Modern views totally condemn this system, as affording space for the accumulation of great volumes of fœtid gases in hot weather, as they entail a slower flow of the stream, giving the sewage time to ferment and to give off its unhealthy exhalations.

The southern slopes are treated on the partially separate system.

The sewers, with the exception of the main outfall, being just so large as to discharge the products of the kitchen, bathroom, and closet, with as much of the rainfall as will serve to flush them, the rest being allowed to follow the surface gutters as far as they can convey it without inundating the contiguous premises.

Where they have conducted the storm water so that its volume is a nuisance, then, from that point to the outfall, a capacious storm-water culvert or sewer should be made; but not any sewage should ever get into it, and it should be quite dry excepting on rainy days. Under this system also all the street open gutters will also be quite dry, excepting on rainy days, and on those days the contents will be inoffensive.

If it be urged that Melbourne is too low and level for efficient deep drainage, it is fallacious; sewage pumps, especially Isaac Shone's pneumatic system, have solved that question economically.

By this plan, sewage can be sent to a sewage farm or any other destination, no matter at what elevation.

The Water and Sewerage Board, of which I am the engineer, being just formed, entails my having, beside a great deal of routine work, a large access of preliminary modes of procedure and other preparatory work for the assistance of the Board; I am therefore obliged to cut short my writing, but I will always be happy to answer questions from such information as I have gathered during nine and a half years of active experience.

* It has not been thought necessary to reproduce this lithogram.

As well as the litho., I forward a pamphlet, being a paper read by me before the Royal Society here about two years since, my opinions on the subject not having changed meantime.

The Commission will, no doubt, have been informed that the southern system of Sydney, though at present without a system of ventilation, has been so laid that, as soon as legislative power is available, ventilators can be attached to all such houses as may be found suitable.

All houses on the northern slopes connected since I took charge have also been fitted with a Buchan ventilating disconnector trap in readiness for the same contingency.

My plan of laying sewers is in straight lines, and, where a change of direction is necessary, a man-hole with a cover at the surface is built, and intermediate lamp holes for ready inspection and the easy location of congestion or obstructions.

I have the honour to be the Commission's most obedient servant (in haste),

J. TREVOR JONES,

Board Engineer, Water and Sewerage Department.

The Secretary, Royal Commission on Sewerage, Melbourne.

APPENDIX I.

SEWERAGE OF CHRISTCHURCH.

SIR,

Christchurch, 21st July, 1888.

In reply to your letter to the Town Clerk of Christchurch, dated 28th of last month, I beg to say that, in answer to clauses Nos. 2 and 4, I enclose you—

Report of Sanitary Commission, dated 7th April, 1862.

Drainage Scheme, by Mr. W. Clark, dated 1878.

Letter and Report from Drainage Engineer, dated 19th July, 1888.

As to the other clauses, numbered 1 and 3, I beg to say, first as to No. 1:—When Christchurch was in a very juvenile state cess-pits were used; but some years ago they were found to be a nuisance, and the pan system was adopted, which is still in use. The pans are emptied once a week into night-carts, and the excreta is taken to some sandy land about three miles from the town, where it is spilled on the surface and immediately covered over with earth. The work is now paid for out of the general rate, and costs £1,400 per annum; but up to about two years ago each person requiring a pan was charged at the rate of 26s. per annum for the service.

No. 3. The back-yard and street refuse is collected by carts daily; the carts are taken to a dépôt in town, and the body of the cart (which is moveable) is taken off and put on to a trolley with a number of others, and taken about three miles away from the town by a tramway.

I remain, Sir,

Your obedient servant,

C. WALKDEN,

City Surveyor.

To the Secretary of the Royal Sanitary Commission, Melbourne.

SIR,

Christchurch District Drainage Board (Engineer's Department),
Christchurch, 19th July, 1888.

In reply to your letter of the 17th instant, asking for certain information about the sewage system here for the Royal Sanitary Commission sitting at Melbourne, I beg to supply the following:—

The surface drainage of the city is collected by the side channels, some of which discharge directly into the River Avon and others into sewers specially provided for storm-water, and which discharge into the Avon and Heathcote Rivers. These sewers have been constructed and are maintained by the Christchurch Drainage Board, which is a corporate body established by Act of Parliament in the year 1875 "To provide for the Drainage of the City of Christchurch and the surrounding Districts."

The sewers proper, for the removal of excreta and house slops, have been constructed and are maintained by the same Board. The area served consists of the city of Christchurch and immediate suburbs of Sydenham, St. Albans, Linwood, and Avon districts; with a population of, say, 25,000. At present, however, not more than, say, 12 per cent. of the houses are connected, so that the full benefit afforded by the sewers has not yet been felt.

Besides taking away the drainage of the district, the level of the subsoil water has been materially lowered; and this fact, taken into account with an excellent system of watertight side channels constructed by the local authorities, and which in many instances do the duty of sewers, has lowered the death-rate from 30 to 15 per thousand annually. When full advantage has been taken of the sewage system it is to be hoped that the results will be even more satisfactory.

The "separate system" has been adopted here, *i.e.*, clean and storm waters are excluded from the sewers, which consist for the greater part of 9-inch pipes. The main intercepting sewers are of concrete, varying in size from 2 ft. 3 in. x 1 ft 6 in. to 4 ft. 9 in. x 3 ft. 8 in. The discharge is collected at a pumping station and pumped on to the Sewage Farm, distant about four miles from the city, where land, consisting of very sandy loam, has been prepared to receive it. Here luxurious crops of grass are grown, cattle fattened, &c., and the profits therefrom will soon equal, if not exceed, the cost of management of the farm. Deep drains then collect the effluent water, which is nearly pure, and discharge it into the estuary.

The total length of storm-water sewers under the Board's jurisdiction is 10 miles 15 chains; of sewers proper, 35 miles 47 chains; and of duplex sewers (taking both storm-water and sewage), 1 mile 26 chains, making a grand total of 47 miles 8 chains.

I enclose a copy of my last annual report, also of Mr. Clark's original report on the question under notice.

I have the honour to be, Sir,

Your obedient servant,

EDWIN CUTTHBERT, M. Inst. C.E.,

Secretary and Engineer.

EXTRACT FROM ANNUAL REPORT, FOR THE YEAR ENDING 31ST DECEMBER, 1887,
OF ENGINEER TO CHRISTCHURCH DRAINAGE BOARD.

Storm-water Sewers.—These sewers are in efficient condition.

Sewage and Duplex Sewers.—No additions have been made to these sewers during the year. They are all in most efficient order, with the exception of a few lengths where roots have got in, owing to clay having been used to plug the eyes in some of the sewers first laid. This is being attended to, but it will prove a source of trouble for some time to come.

There can be no longer any question as to the efficiency of the sewage system generally, the result being most satisfactory. Flushing is regularly and systematically attended to, and no nuisance is caused by the escape of sewer gas at the ventilators; nor need there be any apprehension of danger in the future, as the more houses there are connected the greater will be the flow in the sewers and the less chance of stagnation, which is the cause of the generation of gas. In fact, the time occupied by the transit of sewage from the furthest end of the system (say, at the Lunatic Asylum) to the Sewage Farm is not more than ten hours. The cost of maintenance and repairs for the year has been £528, whereas in the year 1883 it was £927; in 1884, £684; in 1885, £544; and in 1886, £540. It will thus be seen that it has been gradually decreasing, and this year the estimated cost is £348, below which it is impossible to bring it if flushing is to be properly maintained.

House Connexions.—The number of houses connected with the sewers on 31st December, 1887, is as follows:—With the sewage sewers, 803; with the duplex, 36; with the storm-water, 200; total, 1,039. The total number of water-closets connected is 588, in 185 houses. It is to be regretted that the work of connecting is so slow. Much benefit would be conferred on the community at large if the side channels were made to perform their proper functions, viz., the carriage of storm-water only; but this will not be effected until householders are absolutely prohibited from turning their sewage into them, and compelled to connect with the sewers.

Pumping Station.—The machinery at the pumping station is in good working order, and has been carefully attended to during the year. The working expenses for the year amount to £711 6s. 5d., being an average of £1 19s. per day.

The attached return gives all particulars in full:—

Return of Pumping, &c., for the year ending 31st December, 1887.

| | | | | |
|---|-----|-----|-----|--------------|
| Total number of hours worked | ... | ... | ... | 3,776·25 |
| Average number of hours worked per day | ... | ... | ... | 10·35 |
| Average number of tons pumped per day | ... | ... | ... | 6,566·44 |
| Average number of tons pumped per hour | ... | ... | ... | 634·69 |
| Length of sewers in connexion with pumping station | ... | ... | ... | 35m. 47ch. |
| Number of houses connected with same (31 st Dec., 1887) | ... | ... | ... | 803 |
| Number of water-closets connected with same (31 st Dec., 1887) | ... | ... | ... | 588 |
| Number of houses containing water-closets | ... | ... | ... | 185 |
| Amount of working expenses during year 1887 | ... | ... | ... | £711 6s. 5d. |
| Amount of working expenses per day (average) | ... | ... | ... | £1 19s. |
| Cost of pumping 1,000 gallons | ... | ... | ... | 0·318d. |
| Number of rams connected (to 31 st Dec., 1887) | ... | ... | ... | 9 |

Sewage Farm.—Much progress has been made in the works at the farm during the year. A total area of 32a. 2r. 3p. has been prepared for irrigation, and, when the arduous nature of the work is taken into account, the result must be looked upon as most satisfactory. The labour supplied by the Government has been of very great assistance here, as elsewhere, and a considerable time must have elapsed, taking into account the limited means at our disposal, before we could have hoped to have made such progress were it not for such assistance.

Several thousand trees have been planted, and in a comparatively short time what was a wilderness a few years ago will be a picturesque and flourishing farm.

About two and a half years ago the sum of £35 was granted for the purchase of cattle. At the end of last year the value of the cattle on the farm, at a low estimate, was £208, and the credit cash balance on sales £48 4s. 2d. To the foreman's unremitting attention and zeal these results are chiefly due.

The net cost of maintaining and working the farm for the year was £210 4s. 6d., which is less than half the cost of former years. I trust shortly that the expenditure will be covered by the profits.

Rams.—There are now nine rams connected with the sewers; the annual income derived from the same is £42 16s. 6d.

Rivers and Drains.—There is nothing special to report under this head, except that the difficulty in keeping the rivers in a state of efficiency seems to be increasing yearly. This is caused partly by the more prolific growth of weeds and partly by the natural silting up of the beds. Sooner or later some more effectual means than those at present in use will have to be adopted to keep the rivers in a satisfactory state.

The open drains in thickly populated neighbourhoods are frequently in a very foul state; and I see no remedy for this, within the bounds of reasonable expenditure, other than prohibiting householders from draining slops into them, and, where practicable, insisting that they shall connect with the sewers.

The total length of rivers, watercourses, and open drains maintained by the Board is 115 miles 18 chains. The annual cost of maintenance under the present contracts is £1,255 19s. 8d.

In connexion with the cost of maintenance and management generally, I regret that I cannot suggest any further reductions, if anything like efficiency is to be maintained.

The capital expenditure on the works has been a heavy one; but having been incurred, the best thing to be done is evidently to make the most of what we have got, and to maintain the sewers and drains in as efficient a manner as our funds will permit.

I have the honour to be Sir,

Your most obedient servant,

EDWIN CUTHBERT, M. Inst. C.E.,
Engineer to the Board.

APPENDIX J.

DRAINAGE, ETC., OF DUNEDIN.

Town Hall Buildings, Dunedin, 17th July 1888.

REPLIES TO QUESTIONS FROM THE ROYAL SANITARY COMMISSION, MELBOURNE.

1. METHOD OF DEALING WITH THE CITY NIGHT-SOIL.

There are nearly 5,000 houses in the city, and of these about 750 are fitted with water-closets connecting with the underground sewage of the city. The remainder of the houses are furnished with privies, having either a cesspool or moveable box or pan. These are emptied at intervals as the householder may determine. The householder makes his own terms with the nightman, both as to time and cost, the corporation assuming no control unless a nuisance is occasioned.

Earth-closets are very little used, but if used the earth is provided by the householder. The council do not encourage the use of earth, as the whole of the night-soil is conveyed by railway to a dépôt twelve miles outside the city, and the general use of earth or other deodorizing material would greatly increase the quantity to be removed. Further, by the system in operation, all the material collected by the night-carts has to run by gravitation through the several stages of its removal; and the admixture of earth or other dry material in any appreciable degree would make the material too solid, and the system would not work so readily.

The process in operation for the last ten years is as follows:—The night-soil is collected from house to house by authorized men using a specially constructed wood tank on wheels, which when full is brought to the corporation receiving dépôt, situated on the outskirts of the city and provided with a railway siding. At this dépôt the tank is lifted by a crane from the wheels on to a railway truck fitted to receive it, each truck carrying three tanks.

These trucks are taken daily by an ordinary goods or mixed train twelve miles along the Main South Railway Line to the distributing dépôt, and left on another railway siding alongside a large wood tank (30 ft. long) and into which tank the tanks on the trucks are emptied by a shoot, the material flowing chiefly by gravitation with a little raking. The levels and positions of the openings having all to be carefully arranged. The train returns the empties to the town dépôt. Both dépôts are supplied with water and appliances for cleansing, and at the town dépôt a keeper lives on the premises. About two trucks, carrying six tanks, is the daily average sent out.

When placed on the country or distributing siding the material becomes the property of the lessee, who deals with it as he thinks best. The material runs by gravitation from the distributing tank above referred to into his carts or other receptacles. At the present time, it is being dried and manufactured into an artificial manure. Formerly it was simply carted away and spread on adjacent lands.

The term of the existing lease is seven years, and the Corporation pay the lessee £130 per annum. The total cost of the service to the Corporation is £600 per annum.

The cost to the householder for removal from the premises is not known accurately, but probably will be from 10s. to 15s. per house per annum.

The system has worked smoothly and without complaint as respects the city, although some complaints have been made by the settlers in the vicinity of the country dépôt. By the improved process of manufacture it is thought such will be overcome in the future. The lessee is responsible for preventing all nuisance, and with the experience of the past ten years (and ceasing to put it on the land in a raw state) he expects to carry on his contract without offence.

2. THE DRAINAGE OF THE CITY.

The underground drainage of the city is not yet complete, only the principal streets being as yet provided with underground sewers.

The city is divided into five drainage districts, each district having a main intercepting sewer with a present outfall into the Dunedin Harbour, lying to the east of the city.

The plan adopted has been to construct the intercepting sewer in any district, and then, as funds were available, to construct the sewers (discharging into the intercepting sewer) under such streets where they were most required.

The sewers are mostly uniform in section, built of brick and cement, the inverts being 11 or 12 ft. below the surface of the roadway when such depths could be obtained. No brick sewer is less than 3 ft. x 2 ft. in area, and usually constructed of radiated bricks specially manufactured. In a few streets 15-inch and 12-inch earthenware pipes have been laid. The length already completed is 13 miles, and the cost about £42,000.

The sewage is discharged direct into the harbour, without purification; but, as the district intercepting sewers are laid along the lines of old creeks, the sewage matter is largely mixed and diluted with storm-water and with the constant ordinary flow of water from the creeks alluded to.

It has, however, long been proposed to carry an outfall sewer from the city to the ocean beach. Into this sewer all the five district sewers would discharge the usual flow of sewage; which, in flood time, the storm-water would be allowed to run into the harbour.

The house drain-pipes are laid by the proprietors from their premises to the sewer under the street, and consist of earthenware flanged-pipes, usually 6 inches diameter. These pipes are used for all purposes—water-closets, house slops, roof water, and surface water.

The surface drainage of the streets is provided for by the usual channels of pitched stone or concrete. Mud tanks and gratings are placed about five chains apart to convey the channel water into the sewers.

3. COLLECTION AND DISPOSAL OF HOUSE REFUSE AND STREET REFUSE.

The house refuse is collected without cost to the householder. Some premises are visited daily, and others twice a week. The cost of the contract to the Corporation is £400 per annum. The contractor is bound to find a place of deposit, and is responsible for any nuisance occasioned by such deposit. The greater part of the material collected is used in filling up the foreshore of the harbour to the level of the reclaimed land adjacent. The cost is 1s. 9d. per house per annum.

The street refuse is collected under the cleansing and scavenging contract, and deposited as above explained, the best of the material being often used to cover up any objectionable material that may have been tipped in the neighbourhood. This contract includes street watering and sewer cleansing, and amounts to £2,330 per annum, or, say, 10s. per house per annum.

4. OTHER METHODS ADOPTED.

Previous to the inauguration of our present systems, the night-soil was carted to a dépôt of 10 acres in extent, situate just outside the city boundary, and buried in trenches dug for the purpose. These trenches were about 6 feet wide and 4 feet deep, and were covered over with boarding and sods. When full, earth and clay were heaped over the top for a foot or two, and the material was partially solidified by earth being tipped into it, the boarding having been removed if of value. As the suburbs extended this plan ceased to be practicable, and the city being surrounded by other suburban municipalities no suitable dépôt could be obtained within a reasonable carting distance. This led to the adoption of our present system, the demand upon which will be reduced as the underground sewers are extended and more houses are connected with them. Probably the house refuse will at some future time have to be sent out of the city by rail, as the low-lying grounds are gradually filled up.

S. H. MIRAMS,
City Surveyor.

APPENDIX K.

PUBLIC HEALTH DEPARTMENT.

24th January, 1889.

REPORT OF G. J. BUTLER, C.E., relative to complaint as to House and Street Refuse on land between Hanna-street and St. Kilda-road, South Melbourne. Inspected 23rd January, 1889.

A number of new roads or streets in the above locality are now being made up to formation level by contractors of the South Melbourne Local Board; the material used being largely composed of decaying vegetable and animal matter, such as is usually collected by the public scavenger from the houses and streets of a large city; in fact, these new roads or streets are at present the "tip" for the whole of the city of South Melbourne. To speak of such a practice is simply to condemn it, such an insanitary work is likely to prove a great injury to the district; a bad nuisance at present, a worse in the future. The smaller dead animals, as cats, dogs, &c., and also spoilt meat from the butchers' shops, are taken there amongst the garbage, which is spread the width of each road to a height of about four feet.

The contractor is bound under his contract to veneer or cover this six inches thick with the cleaner street sweepings; he has been fined four times during the last fortnight for neglect of this duty; but, in spite of this, the tip when seen by me was not, even in this respect, so well kept as it might be.

The Local Board has lately appointed two additional officers to superintend this work and enforce the provisions of the contract. One of these streets I noticed was being cut through for the purpose of laying a water-pipe; the smell from the excavation, and the filthy water bailed out, was extremely offensive.

It is impossible to say for how long a period the deleterious effects of contaminating soil and air by such an insanitary mode of street construction may continue, or to what distance they may extend.

As regards the complainant's letter I am of opinion that his description of the nuisance may be taken as substantially accurate.

Before making an inspection I called, in accordance with my usual custom, at the Town Hall, and had the advantage of an interview with the Mayor and Town Clerk. Both gentlemen assured me that there is not a member of the Local Board ignorant or apathetic in the matter, that they all admit the evil of the "tip" system, but at present are unable to help themselves; that they have decided in favour of erecting a "destructor," but cannot afford to pay for it out of current revenue, are unable to legally borrow money for the purpose, have endeavored fruitlessly to get an amendment of the Local Government Act to enable them to do so; and that the Government have refused to contribute to the cost of a destructor, considering it to be a work exclusively for Local Boards.

The Mayor said, what are we to do with the stuff? Are we to leave it uncollected in the streets and rights-of-way?

Like the cognate questions of drainage and night-soil, this, as to the proper disposal of towns' refuse, has been delayed, not merely in South Melbourne but throughout the greater part of the colony, until the sad tale of preventible sickness and death from filth diseases is becoming a terribly long one.

Surely something must be done at once, concerted action on the part of some of the Local Boards might perhaps be a step in advance.

Shall the refuse be consumed in a furnace, as it is successfully in many towns of Great Britain?

Shall it be taken out to sea and east into the depths thereof, as is done by the Liverpool people; or shall it, where railways are available, be driven as a scapegoat into the wilderness?

GEO. JAS. BUTLER, C.E.,
Assistant-Inspector Central Board of Health.

APPENDIX L.

ABSTRACT OF REPORT OF CONSTABLE WARDLEY, 3492, RELATIVE TO THE VARIOUS METHODS OF COLLECTING NIGHT-SOIL IN THE CITY AND SUBURBS.

In the city of Melbourne the contract for night-soil removal is let for one year for the sum of £11,850. The Corporation supply the carts, the firm the drivers, horses, &c., about 40 men being employed. The carts leave the depôt, near the gas works, about 10.30 p.m. daily, get loaded before 2 a.m., and return after delivering the load at various times from 7 a.m. to 1 p.m. The contractors sell the manure to market gardeners between Caulfield and Kingston, at prices ranging from 2s. 6d. to 5s. per load. Not less than two loads will be delivered. The manure is deposited on the land by opening a small trap-door at the back of the cart while the cart is in motion, and thus a continuous stream is deposited for about 80 yards; the manure is then spread on the land and ploughed in. The whole operation is often completed before the night-carts have left the land. The carts are washed externally with a bucket-full of water from a water-hole, if there is one near.

Other firms also contract for cleansing closet pans in the city. The Hesse Domestic Sanitary Company employ ten carts. (The system adopted is described in the evidence of Mr. Hesse, p. 153 of Minutes of Evidence.) Messrs. Draper and Sons employ eight carts, and deposit the manure at East Brighton. The firm supplies patent dry earth closets, constructed so as to sprinkle pulverized earth mixed with carbolized sawdust on the night-soil in the pan. Some of the carts leave the depôt at 10 p.m., and return between 6 and 8 a.m.; others start at 3.30 a.m., and return between noon and 2 p.m.

At South Melbourne, St. Kilda, Prahran, North Melbourne, Richmond, and Fitzroy, the system is almost identical with that adopted for the city of Melbourne, except that in some cases the contractors provide their own carts, or some of the carts, and that the manure is deposited in different localities:—That from South Melbourne, at South and East Brighton; that from Prahran, between Cheltenham and Dandenong; that from North Melbourne, at Cheltenham, Moorabbin, and East Brighton; that from Richmond, at Boroondara, Caulfield, East Brighton, and Camberwell; that from Fitzroy, on market gardens about nine miles out on the Plenty-road; that from Collingwood, at Thomastown.

It is estimated that about 150 loads of night-soil are collected nightly in the city and suburbs, and the sum paid under contract for cleansing pans by the Melbourne, South Melbourne, North Melbourne, Richmond, Fitzroy, Collingwood, Prahran, and St. Kilda Councils amounts to about £35,000 annually. Many of the men employed are at work from 16 to 18 hours. The night-soil is carted 10 or 15 miles, and the cart and load generally weighs about 2½ tons. In some instances the drivers have a check or way-bill given to them by the foreman, on which is stated the number of loads to be delivered to any person, and the person who receives the number of loads specified on the check signs it and returns it to the driver; but a check may be signed for a full load when perhaps half of it has been deposited on the road to lessen the horse's work.

The night-soil received by the Hesse and Draper Companies is nearly solid, and could not be deposited on the roads very conveniently.

APPENDIX M.

EXTRACT FROM GRANT OF LAND IN THE PARISH OF DOUTTA GALLA, AS

A site or place where cattle may be slaughtered for the use and convenience of the inhabitants of the said city and all other persons resorting thereto To have and to hold the same and every part thereof unto the mayor aldermen councillors and citizens of the said City of Melbourne and their successors for ever and for the purposes and in manner aforesaid Reserving and excepting nevertheless unto us our heirs and successors All such parts and so much of the said land as may hereafter be required for a public way or public ways in over or through the same to be set out by our Governor for the time being of our said colony or some person duly authorized in that respect And also all mines of gold of silver and of coal with full and free liberty and power to search for dig and take away the same And also the right of full and free ingress egress and regress into out of and upon the said land for the purposes aforesaid Provided nevertheless and we do hereby expressly declare that this our royal grant is and shall be subject to the condition hereinafter mentioned that is to say that the said piece or parcel of land hereby granted and every part thereof shall be at all times hereafter set apart maintained and used by the said mayor aldermen councillors and citizens of the City of Melbourne and their successors as and for a place where cattle may be slaughtered for the use and convenience of the inhabitants of the said city for the time being and all other persons resorting thereto and for no other purpose whatsoever Provided also and we do hereby further declare that if the Corporation of the said City of Melbourne under the name style and title of the said mayor aldermen councillors and citizens of the said City of Melbourne shall be dissolved or by any means become extinct and be no longer existent or shall suffer the said piece or parcel of land hereby granted or any part or parts thereof at any time to cease by the space of one year to be maintained or used as or for the purposes of slaughtering cattle as aforesaid or in connexion therewith or permit or suffer the same or any part thereof for and during such space of one year to be used or applied to any other purpose whatsoever than as or for a place for slaughtering cattle as aforesaid or shall alienate or attempt to alienate in fee-simple or for any less estate or interest to any person or persons whomsoever the said piece or parcel of land or any part thereof (save and except in pursuance of the powers and authorities now vested or hereafter to be vested in the said mayor aldermen councillors and citizens of the said City of Melbourne under and by virtue or in pursuance of any Act or Acts of the Governor and Legislative Council of the said colony of Victoria now in force or hereafter to be in force within the said colony) it shall be lawful for us our heirs and successors by any person or persons duly authorized in that behalf by our Governor for the time being of our said colony to re-enter upon the said land or any part thereof and to hold possess and enjoy the same as fully and effectually to all intents and purposes as if this grant had not been made.

APPENDIX N.

EXTRACTS FROM BY-LAW 41 OF THE CITY OF MELBOURNE FOR THE
REGULATION OF THE PUBLIC ABATTOIRS.

II.—Every person who shall pay to the superintendent of the abattoirs the dues for slaughtering according to the rates hereinafter fixed shall be entitled to the use of that portion of the abattoirs which shall be appointed to him by the superintendent of the abattoirs and of the appurtenances of the same for the purpose of slaughtering any of the animals which may lawfully be slaughtered therein for a reasonable time not exceeding the time hereinafter mentioned, viz.: for the killing and dressing of an ox or a cow bull heifer or steer forty-five minutes, of a calf or pig thirty minutes, and of a sheep lamb or goat twenty minutes.

III.—Every person who shall so use the abattoirs or any portion thereof or of the appurtenances of the same shall immediately thereafter remove all the offal filth and refuse of every description whatsoever which shall remain or result from such use of the abattoirs by him from the abattoir premises to the pits or places appointed for the reception of such offal filth or refuse and shall cleanse thoroughly to the satisfaction of the superintendent of the abattoirs all the portion of the abattoir buildings and appurtenances which he shall so use.

V.—Every person who shall drive bring convey or conduct any live stock to the abattoirs for the purpose of slaughter shall inform the superintendent of the abattoirs of the description and number of such stock and the superintendent shall enter the information so tendered to him in a book to be kept by him for that purpose the succession of entries in which book shall in case of any question arising decide the order of priority in which the several persons shall be entitled to the use of the yards pens killing houses or appurtenances of the abattoirs and if no place shall have been previously appointed for the reception of the live stock of the person so bringing the same such person shall place such live stock in such portion of the yards pens or premises of the abattoirs as the said superintendent shall direct and the person so bringing such live stock shall himself be responsible for the safety thereof.

VII.—If any person shall desire to kill live stock in one particular portion of the abattoirs under such condition as to time and otherwise as the said council shall think necessary and prescribe and shall have a portion of the abattoirs pointed out to him for that purpose, such person shall at all times while he shall use such portion of the said abattoirs keep the same with the appurtenances thereof clean and free from offence whether by accumulation of blood filth or otherwise and shall further whenever so required by the superintendent of the abattoirs cleanse scrape lime wash or otherwise purify in such manner as shall be necessary and as the said superintendent shall direct the walls doors floors or other parts of the portion of the said abattoirs and appurtenances which he shall be so accustomed and entitled to use and he shall in all respects comply with the regulations of the Council of the City of Melbourne for the government of the abattoirs in force for the time being.

VIII.—Every person who shall bring cattle for slaughter to the said abattoirs and shall permit the same to remain in the yards or pens of the said Abattoirs for a longer period than one day shall provide such live stock with sufficient food and water.

IX.—Any person who shall deposit any offal filth or refuse matter upon any portion of the buildings or land of the abattoirs or on any land or road abutting thereon save in the offal pits or places appointed for the reception of the same shall for every such offence on conviction thereof before anyone or more of the justices of the peace for the said city forfeit and pay any sum not less than one nor more than ten pounds.

X.—For every offence against any of the provisions hereof for which no fixed penalty is hereinbefore prescribed the offender shall upon conviction thereof before any one or more of the justices of the peace for the said city forfeit and pay a penalty not exceeding ten pounds.

APPENDIX O.

ABSTRACT SHOWING THE IMPORTANT CONDITIONS SUBJECT TO WHICH
BUTCHERS ARE PERMITTED TO TEMPORARILY OCCUPY PORTIONS OF
THE CITY OF MELBOURNE ABATTOIRS RESERVE FOR BOILING-DOWN
WORKS.

2. That the animal offal and refuse resulting each day from my business at the abattoirs as a butcher shall be boiled down on the same day, and that it and any other animal or other matter which shall be boiled down upon the said premises shall be so boiled down only in air-tight vats, of which I hereby undertake that I will erect one forthwith and as many more as may be requisite for my business, if one be, in the opinion of the City Council, insufficient.

3. That no nuisance shall be created or suffered to exist on the premises.

4. That he shall not let, sub-let, nor attempt to let or sub-let, or assign, the land or premises or any part thereof.

5. That the premises shall be under the surveillance of the superintendent of the abattoirs, and that his directions as to the lime-washing, ventilation, and cleansing in all respects of the premises shall be complied with by me without delay.

6. That the pens and structures and the business carried on therein shall be subject to and in compliance with such rules and regulations as the Council of the City of Melbourne, in its corporate capacity, or as the Local Board of Health for the City of Melbourne shall from time to time prescribe.

7. In the event of any nuisance being created, or if any breach of these conditions be committed, or if the council deem it necessary, they can give notice in writing for occupant to yield up peaceable possession within one calendar month from the date of such notice, and to leave the land in a condition satisfactory to the city surveyor; and the council may resume possession of the said land.

APPENDIX P.

RULES AS CONDITIONS OF PERMISSIVE OCCUPATION OF SITES AT THE CITY OF MELBOURNE ABATTOIRS NECESSARY FOR THE UTILIZATION OF THE OFFAL AND REFUSE RESULTING FROM THE SLAUGHTERING THERE, VIZ.:—

1. *Surface to be pitched.*—That the surface of every such site be pitched with stone, and with pitch drain to the Saltwater River; the materials, workmanship, levels, &c., of the pitching, drains, or other necessary works to be subject to the approval of the city surveyor.

2. *What offal to be brought.*—That no offal or refuse other than that arising in connexion with the slaughtering at the abattoirs be brought upon the premises.

3. *None in state of putrescence.*—That no offal or other matter whatever in a state of putrescence be brought to or boiled down at the premises.

4. *No putrescent matter to remain on premises.*—That no bones, offal, or other animal matter in a state of putrescence shall be allowed to remain at any time upon the premises.

APPENDIX Q.

DESCRIPTION OF THE CITY ABATTOIRS AND NOTES OF INSPECTIONS
BY THE COMMISSION,

Made on Tuesday, April 24th, 1888. Present—Messrs. Akehurst, Hodgkinson, Girdlestone, Prof. Masson, Dr. McCrea, and the Secretary. Monday, May 14th, 1888. Present—Prof. Allen and the Secretary, accompanied by Mr. Le Capelain. Thursday, July 24th, 1888. Present—Mr. Akehurst, Prof. Allen, and the Secretary.

(Compiled by the Secretary with the assistance of Mr. S. Le Capelain.)

The Site.—The land granted by the Crown to the Corporation of the City of Melbourne as a site for the City Abattoirs consists of some 57 acres in the parish of Doutta Galla. It forms a long narrow strip of ground, which extends for a distance of 52 chains from the Saltwater River to the McAulay-road. On the north-eastern side it is separated from the Flemington racecourse by the Smithfield-road. The ground is for the most part very low, and consists, for a distance of 40 chains from the river, of an estuary bed of Post Pliocene clay and sand; then an escarpment of volcanic basalt rises up somewhat abruptly, and forms, for the remaining 12 chains, the slope of a slight hill. On the summit of this hill are the cattle-yards, separated from the abattoir ground by the McAulay-road. The central portion of this rising ground presents a depression, which continues down the middle of the site to the river. Along this depression a drain has been made, and into this the paddocks on either side naturally drain. The actual levels of the McAulay-road above low water in Hobson's Bay are:—56·5 feet at the southern end; 16·10 feet in the middle; and 42·8 feet at the northern end. At a distance of 12 chains from the McAulay-road, that is, at the foot of the rise, the levels are:—10 feet at the southern end; 6 feet in the middle; and 10 feet at the northern end. From this point to the river, the ground, though everywhere low, is slightly undulating. Just beyond the southern half of the hill there is a marked depression, in which water lodges; while about half-way between the McAulay-road and the river, on the northern half of the ground, there is a slight elevation, the levels of which vary from $7\frac{1}{2}$ to 9 feet above the datum line. This elevation begins 25 chains from the McAulay-road, and extends for a distance of 5 chains. On it are erected the abattoirs buildings. From the buildings to the river the ground has a fairly uniform fall of about 1 in 513·6.

Number of Stock Slaughtered.—The number of stock slaughtered at the City Abattoirs in 1887 was:—Cattle, 47,017; calves, 5,414; sheep and lambs, 312,782; pigs, 6,560.

The Buildings.—The site of the buildings is shown on the accompanying tracing plan, to which reference will be made in the following description:—1 and 2 are similar buildings, with stone walls; the height to eaves is 15ft. 6in.; the roofs are of slate; each building comprising six compartments, each 33ft. x 12ft. 6in., again divided for killing and hanging stalls, and each compartment having two small fenced-in yards at the back, marked (a) and (b) on plan. The floors are paved with squared bluestone pitchers, grouted with cement. The several compartments are separated by walls 7ft. 6in. in height, having strong lattice-work above to height of eaves. At the time of inspection the floors and walls were in a passable condition; scraping, cleansing, and lime-washing floors and walls after slaughtering work being, apparently, well attended to. 3 and 4 are brick buildings, used for sheep slaughtering; walls 14 inches thick; 15ft. 6in. high from floors to eaves, covered with corrugated iron roofs; each building comprising five compartments, each 33ft. x 14ft. These compartments are separated by timber partitions, about 4ft. in height, having lattice-work above to height of eaves. The floors are paved with bluestone flagging. The killing is done at the back under a lean-to shed, or verandah, which, with the attached small yards, are marked (c) and (d) on the plan; the latter are paved with squared pitchers, and grouted with cement between the joints. Both buildings, in all compartments, were in fairly good order.

The block buildings, marked 5 and 6, each having an enclosed paved yard space, are partly used for cattle and partly for sheep slaughtering. They are stone buildings with slate roofs, walls 15ft. 6in. to eaves. The side portions of each building, 40ft. x 16ft., are paved with squared stone pitchers grouted with cement; the back portions, each 46ft. x 16ft., are divided into three compartments, chiefly used for slaughtering sheep. The floors are paved with bluestone flagging, on which are placed the usual wooden

gratings for the killing process. The stall floors are cleansed and the walls scraped and lime-washed every time after killing. On the small space marked 7 is a shed, constructed of rough hardwood palings, rented and used by Mr. T. K. Bennet for sheep and pig slaughtering; it is in a very dilapidated condition, has a very detractory effect on the other buildings, and, besides, it is always difficult to keep a place of this kind in a cleanly state. The floor is paved with flagging and with pitchers (most of these with the cement washed out at the joints) on which wood gratings are used for slaughtering sheep; 8 is the residence of the superintendent and inspector of cattle-yards; and 9 is the overseer's residence. The whole surface area within the large block marked 10, 11, 12, 13, including the various buildings above described, the yards, roadways, and lanes, is stone paved in every part. All the yards are provided with drinking troughs, and the paved drains from the killing places and water taps concentrated to a main paved and cemented channel leading directly to the river, as shown on plan by the dotted lines marked G, H. The difference or fall to the average level of the river is about $2\frac{1}{2}$ feet. Instead of pits for catching gross refuse matter contained in the drainage, gratings and side platforms are used; of which there are three inside the block and three along the course of the outlet channel. The thick animal matter arrested by the gratings and scraped on to the platforms is daily removed and buried in one of the adjacent paddocks with the blood and offal refuse collected from the several killing places; but there is now in course of erection, in the paddock adjoining, a desiccator, with all necessary appliances for cremating and carbonizing every kind of offensive refuse matter.

THE GENERAL CONDITION AND MANAGEMENT.

Insufficient Accommodation—Imperfect Ventilation.—The buildings do not provide sufficient accommodation, are cramped and imperfectly ventilated; the carcasses hang too close together, and, at the visit on the 24th July, it was found that the carcasses were double-banked in one of the hanging rooms.

Walls.—There is too much woodwork in the partition walls.

Floors.—The cement grouting between the stone pitchers of the floors has been worn away in places, leaving crevices where blood can lodge and soak through into the ground beneath. The floors are not sufficiently sloped to the drains to allow blood to run away freely. In some of the sheep-killing places undue accumulations of blood were found under the wooden gratings on which the sheep are killed, and offensive organic matter was found adhering to the under surface of the gratings themselves. On the floors of several of the hanging-rooms there was an uneven crust of lime mixed with blood, produced by sprinkling lime on the floors before all the blood had been properly removed.

Drains.—The fall in some of the drains within the buildings is insufficient, and blood and blood-stained fluid were found collected in them and almost stagnant. One drain was found blocked up by the gratings placed on the floor.

Yards.—The yards in which cattle are kept, prior to slaughtering (within the enclosure 10, 11, 12, 13 on the plan) are not covered or provided with any shelter. They are square in shape, with no converging drive, to facilitate the quiet entry of stock.

Accommodation Paddocks.—The accommodation paddocks lie between the abattoir buildings and the McAulay-road on either side of the central depression before mentioned, and are therefore partly on the low-lying ground and partly on the higher slope. When visited on the 26th of July, after some heavy rain, the paddocks near the abattoirs were very slushy, presenting a sheet of mud, but they were not flooded. Hay was lying in the paddocks, and there was a water-trough in each paddock. There was no grass in any of the paddocks.

Treatment of Blood and Offal.—When the animals are killed and bled, the blood runs over the floor of the killing place, and a considerable portion of it at once clots and remains on the floor. The liquid portion runs slowly off into the drains, and then by the main blood drain to the river; any further clots that form, or are carried with the liquid portion, are arrested by the gratings. The clotted blood is swept up, collected, and removed; and then the floors are washed down with water, and the dirty blood-stained washings pass along the same drains to the river. The blood collected from the floors and from the platforms at the side of the gratings is, as before stated, buried in trenches in the paddocks lying between the abattoirs and the river. Along with the blood are buried the contents of the panniches, the sweepings of the yards, and such offal as is not removed by the butchers to be boiled down, or by the gut-scrapers and gut manufacturers. Some of the offal is also carted to farms to be used as manure.

The process of burying the blood and offal in trenches was carefully inspected on the 24th April and 14th May. The trenches were dug about $2\frac{1}{2}$ feet deep, in very moist soil. The blood was placed at the bottom, and in one trench plucks, trotters, ears, and intestines were also noticed; over these the paunch contents and yard sweepings were placed, with a little lime, and, finally, the soil that had been removed was placed over all. A faint peculiar smell was perceptible all over the paddock where this trenching had been carried on.

The ground was opened up in places where blood and offal had been trenched in some four or five months previously. An offensive ammoniacal odour was perceptible, and the soil evidently contained decomposing animal matter. On the 14th of May, ground in which blood and offal had been buried four or five years ago was dug up. Water was reached at a depth of 4ft. 9in. The soil was darkly stained, and it was evident that the animal matters there buried were not as yet completely transformed. The soil had a faint offensive smell. There had been rain the previous day, and the trench in which fresh blood was being placed contained water. This was being drained away by digging a small channel in the earth leading towards the main drain.

Drains.—This main drain, as before mentioned, runs down a central depression between the paddocks to the Saltwater River, and receives the surface drainage from them; at its lower end it also receives some of the foul drainage from the piggeries and other noxious trades on the river bank. This drain has not sufficient fall; it is pitched as far as its embouchure to the river, where it becomes an open wood culvert, which is coated with filth.

Pollution of River.—The blood drain from the abattoirs has a better fall, and is well cemented, but its contents were very deeply stained with blood, and the river where it receives this drainage was of a lurid red colour, with bubbles of gas all over its surface. Opposite the noxious trades and the drain from the paddocks the river was even more polluted, and contained much decomposing animal matter.

APPENDIX R.

Melbourne, November 19th, 1888.

ESTIMATE OF PROBABLE COST, WHEN COMPLETED, OF THE BUILDING AND MACHINES ERECTED FOR TREATMENT OF SLAUGHTER REFUSE AT THE CITY ABATTOIRS, DOUTTA GALLA.

| | | | |
|--|-----|-----|---------------------|
| For machinery, connections, and cost of erection | ... | ... | £6,000 |
| Cost of boilers and setting | ... | ... | 1,200 |
| Buildings, with hoist, and foundations for machinery, including trucks for conveying blood and offal | ... | ... | 3,800 |
| | | | <hr/> £11,000 <hr/> |

A. C. MOUNTAIN,
City Surveyor.

APPENDIX S.

DESCRIPTION OF THE SUBURBAN ABATTOIRS AND NOTES OF THE INSPECTIONS OF THEM BY THE COMMISSION.

(Compiled by Mr. S. Le Capelain and the Secretary.)

SOUTH MELBOURNE CORPORATION ABATTOIRS.—LEASED TO MR. A. TATE.

Site.—The site is about 10 chains from the River Yarra (see locality plan), and very low-lying.*Area.*—The proclaimed area reserved for these abattoirs is a rectangle of 10 chains by $1\frac{1}{2}$ chains, comprising $1\frac{1}{2}$ acres of ground; but, at present, this is only partially and very irregularly fenced.*Buildings.*—The main building is an old very dilapidated wooden structure, and the adjacent smaller shed-places are in about the same condition of decay. The floor area of the main portion, 74 x 37 feet, is paved with squared stone pitchers, and is used both for sheep-killing and for hanging carcasses. The adjoining cattle-slaughtering shed, 30 x 30 feet, is also paved with stone pitchers. The interstices in the paving in both places are greatly in need of filling up with good cement grouting. The weekly slaughtering averages 120 cattle and about 1,200 sheep.*Drainage.*—The gross drainage from the cattle-slaughtering place flows outside into a small trough, and the drainage from the sheep-killing place, with the overflow from the trough, pass off the premises in a wooden channel, in which, at about 70 feet from the building, there is a small intercepting pit; but evidently neither the trough nor the pit is of any service, as, for instance, at the time of inspection they were both choke-full, and the gross drainage, with clots of blood, was moving sluggishly towards the large paved open channel constructed by the Harbour Trust, to discharge into the Yarra. I was informed the blood was daily removed to farms at Brighton, and all offal collected and sent away every evening to a farm at Spring Vale. A roughly-constructed wooden manure box close against the main building attracted attention, as there was a stream of soakage from it flowing into some stagnant pools near the entrance gates. At the rear of the buildings there are also large ponds of stagnant drainage.

Notes of Inspections by the Commission. On May 2nd, 1888. Present—Messrs. Akehurst, Hodgkinson, and the Secretary; and on May 16th. Present—Prof. Allen and the Secretary.

Within a short distance of the buildings were several stagnant pools, some covered with a thick, green, slimy scum, others of various hues of brown and red—bubbles of gas were evolved all over the surface, showing that decomposition was going on, and noisome odours were exhaled from the pools and from the thick deposit of filth on their margins.

The ground all round the buildings is very low-lying, and practically undrained. The yards were also very untidy, with heaps of manure lying about.

The sheep are killed on wooden gratings, which were dirty, with filth accumulated underneath them.

The main drain contained a filthy sediment right up to its embouchure into the River Yarra, and the smell from this drain was very offensive.

When inspected, on May 16th, 1888, a mass of decomposing blood clot and offal was found swept up into a heap near the door of the slaughter-house.

The wooden drain was choked with clotted blood and offal.

The cattle-yards were partly covered with water, and were everywhere slushy.

PORT MELBOURNE CORPORATION ABATTOIRS.—LEASED TO MR. C. A. KENNETT.

Site.—The site is about 8 chains from the River Yarra (see locality plan), and very low-lying.*Building.*—The building is of wood, covered with a corrugated iron roof; the main portion, 54ft. x 37ft., is used for hanging carcasses and for sheep-killing. The side walls are 10ft. from floor to eaves, and there is a lofty mansard or double sort of roof with intervening louvres affording good means of ventilation. The floor, paved with squared stone pitchers, was at many places in need of cement grouting in the interstices. The attached killing shed for cattle, 30ft. x 24ft., is a wooden structure similarly paved.

Drainage.—The three drains (as shown on the plan) meet outside the building, and form one channel, across which are two gratings for collecting gross blood and animal matter. Beyond these gratings the drainage is carried off in a wooden channel to the large open stone-paved drains constructed by the Harbour Trust, to discharge into the Yarra.

Accommodation Yards.—Only the small yards near the cattle-killing stalls are pitched. There are two drinking troughs for cattle and one for sheep. From 60 to 80 head of cattle and 600 to 800 sheep are weekly slaughtered. There were 20 pigs about the yards, said to be brought there for slaughtering, and there are no sties at present on the premises, old sheep-sheds being used merely to shelter these animals. The slaughtering and hanging places are said to be cleansed and lime-washed once a week; and the blood, with all offal and refuse animal matter, removed to a farm at Spring Vale.

Notes of Inspections by the Commission.—On May 2nd, 1888. Present—Messrs. Akehurst, Hodgkinson, and the Secretary; and on May 16th. Present—Prof. Allen and the Secretary.

The wooden blood drain contained a quantity of clotted blood, and its sides were coated with dried blood. The flow in it was very sluggish, and the contents evidently overflow at times and soak into the soil. In part of its course this drain passes through a railed-in yard, in which were pigs, feeding on the blood.

The movable gratings for the drains were removed at the time of inspection, and all clots, &c., were passing down to the River Yarra.

The main pitched drain made by the Harbour Trust ends in a wooden culvert; and here pieces of offal were found, and the lower part of the sides of the culvert were covered with a crust of filth three or four inches thick. The smell from this drain was very offensive.

The walls of the slaughter-house were coated with adherent clotted blood and filth. Between the pitchers of the floor were crevices five inches deep, in which blood was stagnant.

The sheep were killed on wooden gratings, under which a good deal of blood and refuse was collected.

Adjacent to the slaughter-house is a wood building, in which pigs are sealded, scraped, &c., and in which boiling-down of refuse from butchers' shops—fat, &c.—is carried on in closed vats, the steam and vapours from which are led by a pipe to a condenser, and then run off into barrels and removed. There was an offensive boiling-down smell about the place. The greater part of the floor was earthen, and soaked with the washings from the pig scrapings. At another inspection, on the 16th of May, 1888, it was found that fatty matter from this boiling-down building was draining into the blood-drain and choking it up, and the pigs were found in the abattoirs themselves feeding on blood and offal. The closets were in a filthy condition, with excreta and paper above the level of the seat.

RICHMOND CORPORATION ABATTOIRS.

Site.—The site is near the Yarra River bank, and only a short distance from the Burnley railway station. (See locality plan and the plan showing details of the buildings.)

Area.—The area of ground held by the Richmond Corporation for abattoirs is $7\frac{1}{2}$ acres; but a portion is now occupied for quarrying and by a stone-breaking mill for road metal and asphalt material.

Buildings.—The structure forms a square, enclosing a central pitched yard, 52 x 34 feet, leaving an entrance from Berlin-street. The walls throughout are of bluestone, 13ft. high from floor to eaves, and the compartments are open to the slate-covered roof. The corner compartments, at the east side, are cattle-killing stalls, 15 feet x 15 feet, and between these is the hanging place, 35 feet x 15 feet. The floors are paved with squared stone pitchers, and were in tolerably good order. There are seven sheep-killing stalls, each 15 feet x 15 feet, all paved with bluestone flagging, in fairly good order. The blood is daily collected, and with the paunch refuse and other offal removed to farm lands at Preston.

The drainage from washing floors and walls and liquid blood flows to a pit in the central yard (see plan), where it is treated with a solution of sulphate of iron, kept trickling out of a small cask placed over the pit, and thence passes on over a paved drain to the creek channel leading beyond Berlin-street to the river. The walls are scraped and lime-washed once a week.

Accommodation Yards.—The smaller yards around and near the building are paved with squared pitchers, and the larger ones with rough pitching, chiefly quarry spalls. There are troughs with water laid on available to the large yards.

One hundred and twenty cattle and about 2,000 sheep are slaughtered per week.

At the inspection by the Commission on May 23rd, 1888 (present—Mr. Akehurst, Prof. Masson, and the Secretary), a heap of offensive refuse was found in the yard, although it was stated that all blood and refuse were removed daily. The guts were (so it was stated) also removed daily by the gut-scrapers. There appeared to be hardly sufficient slope to the floors of some of the killing stalls, the liquid blood lying about instead of draining away. No wood gratings are used for killing sheep on.

FOOTSCRAY ABATTOIRS.

Inspected on August 14th, 1888. Present—Mr. Akehurst, Prof. Allen, Mr. Girdlestone, and the Secretary.

1. LEASED BY DUNDAS BROS.

These premises are situated near the bridge over the Saltwater River, and originally were erected for the Australian Meat Preserving Company. (See locality plan.) The principal portions of the buildings are of a substantial character, the walls of stone and brick, and the panels between the piers filled up with brickwork. Height of walls to eaves, 15 feet; ventilation amply provided. The floor of the cattle-killing place is paved with bluestone flagging, and the floors of the carcass-hanging portion of the building and of the sheep-killing place are brick-paved. A large paved square space, at the rear of the building, 60 feet x 56 feet, comprising several sheep pens, is covered with an iron roof. Wooden gratings are used on the sheep-killing floors, and these were not in as cleanly a condition as should be. The interior drain

channels lead outside to the blood pit or directly to the river, as may be regulated by a small shuttle or board fixed across the drain. The average weekly slaughtering amounts to 150 cattle, 3,500 sheep, and 150 pigs. Three of the yards are paved with squared pitchers, and the two larger ones with spalls or large rough metal. There are also two unpaved sheep-yards. At the time of inspection the yards were in a muddy, uncleanly state, and it was noticed that pigs were allowed access to the blood and offal pits. There are two drinking troughs for cattle and two for sheep. It was said the killing and hanging places were cleansed and lime-washed once a week—on Saturdays.

2. LEASED BY JOHN BRUNDELL.

Site.—These premises are adjacent to those of Dundas Bros.

Buildings.—The killing-stall for cattle is about 60ft. by 25ft. The walls are bluestone, about 13 feet high to the eaves. The floor is bricked, and sloped to a central bricked drain. The roof is of galvanized iron. The sheep-killing portion is constructed of galvanized iron; the floor is pitched, and uneven. Wooden gratings are used on the floors.

Ventilation.—The ventilation is by the open doors and at the roof, and is sufficient.

Drainage.—The inside drains from both buildings lead to blood-pits. At the visit of the Commission the drain from the cattle-stall was purposely blocked up so that the blood could not pass into the pit, while the pit was used as a receptacle for a copper in which water was being boiled. The blood-pit connected with the drain from the sheep-stall was overflowing. The result was, that almost all the blood passed into the river.

Treatment of offal.—It was stated that the offal was carted away daily. Some of it, however, is thrown into the river, as are also the paunch contents.

Accommodation yards.—The cattle-yards are pitched; they are divided into two, but there is only one water trough. There is no shelter for the stock. The sheep-pens are pitched, and are also without shelter sheds. The yards were dirty, muddy, and untidy, with accumulations of manure lying about, and skins hanging on the fences.

Number of stock slaughtered.—One hundred and twenty cattle, 2,000 sheep, per week.

THE WILLIAMSTOWN ABATTOIRS.

Inspected on July 5th, 1888. Present—Mr. Akehurst, Professors Allen and Masson, Dr. McCrear, and the Secretary.

Site.—The Williamstown Abattoirs are situated about one mile from the North Williamstown railway station, on low-lying swampy ground, about 11 feet above low-water spring-tides.

Area.—The total area of paddocks is 8a. 0r. 2p. The area occupied by buildings and small yards is 1a. 3r. 8p.

Buildings.—The killing-stall for cattle is 22ft by 16ft. The walls are bluestone rubble to about 6ft. above the floor, and wood from this to the eaves (8ft.), making the height of the walls 14ft. The walls are lime-washed. The floor is stone-flagged, and has a fair fall to a blood-pit outside the building. The roof is of galvanized iron. The ventilation is good. The hanging room, for carcasses of cattle, is 32ft. by 16ft. The walls, of wood, covered with iron, are 14ft. in height. The floor is asphalted. The ventilation is good, the interior being open to the roof, which is of galvanized iron. At the south side of these buildings are two lean-to rooms, each 20ft. x 12ft., with wooden walls. In one of these is an open copper vat, in which tallow is boiled down. The other is used for pickling hides. The sheep-killing rooms are two in number, each 12ft. 6in. by 12ft. 6in. The walls are of wood, 10ft. (to the eaves) in height. The floors are cemented, with a good fall to a small paved drain. The sheep are killed on raised wooden gratings. The roof is shingled, covered with corrugated iron externally. The ventilation is good. The sheep-carass hanging room is 25ft. x 14ft. 6in. The walls are of wood, 10ft. (to eaves) in height. The floors are cemented. The roof is shingled, and covered with iron. The ventilation is good. The pig-killing place is a wooden building, 16ft. x 15ft. x 10ft. high, and is separate from the other buildings. The floor is pitched, with a fall to a pitched channel in front and outside of the buildings. The pigs were laid over this channel, so that they bled into it.

Pigs are kept in two pig-sties. The floors of these are paved with stone pitchers, but there is not sufficient fall, and they are not kept dry. The sties are built of wood.

Drainage.—From the cattle slaughter-house the drainage flows to a catch-pit just outside. From this the blood is ladled out into wooden tubs, while the overflow runs down a pitched open channel through the yard between the main building and the pig-killing shed, the drainage from which it receives; then it continues past the large pig yard, and on to 2½ chains beyond the boundary fence, where it becomes a mere earthen channel, in which the contents stagnate, with a filthy seum on the surface, and gradually soak into the soil. Finally, the drain discharges into low swampy undrained ground (Crown land), between the abattoirs and the Kororoit-road. The channel is very badly pitched, blood and blood-stained fluid soaking into the ground through interstices between the pitchers. The drain also evidently gets blocked up at times, and then the contents are, apparently, simply raked out on to the adjacent soil. At the visit of the Commission the blood from the sheep-killing place passed down a wooden shoot into an enclosure, where pigs fed on it. At Mr. Le Capelain's inspection, on August 9th, 1888, the blood was caught in a small pit, and the washings passed off by a small paved drain, which joins the main drain near an offal-pit.

The paddocks for the cattle were in a wet, boggy condition. There is only one water trough, the tap to which was broken. The trough was very dirty, and covered with fungoid growth.

The sheep yards.—Some are pitched, some are not. They are provided with water.

Treatment of blood and offal.—The blood and offal was said to be buried 3 feet from the surface in pits. At the visit of the Commission there was, about 35 yards from dwelling-house, an open pit dug in the ground, and nearly filled with blood and offal; it also contained dead dogs and other refuse. No earth had been placed over this. On examining a pit recently covered over, and letting a pick fall into it, offal was brought up from within a few inches of the surface. Apparently only a few pits have been dug and covered in. There was a very strong and offensive odour from these.

Number of stock slaughtered.—140 head of cattle, 12,000 sheep, 40 pigs, per week.

Tenure.—Leased by David Morgan from Corporation of the town of Williamstown at a rental of £146 per annum.

General remarks.—On approaching the abattoirs, a strong, offensive smell was noticed from the swamp into which the drain discharges. The whole place was very untidy and dirty, bleached bones and heads lying about, and heads with skins on, partially decomposed, while hides and portions of hides hung on the fences. In the cattle-hanging room heads and hides were lying about on the floor, which was very dirty, and the carcasses were rather crowded. (Mr. Le Capelain noted at his visit, on August 9th, 1888, that the floors were clean and there were very few carcasses.) The wooden frames, or stages, on which the sheep are killed were very dirty, with accumulations of blood and filth on their under surface and between the railings. The pig-sties were very dirty; offal, blood, and ordure were all mixed up together on the floors, and the walls were crusted with lime and dirt. Between the slaughter-house and the piggeries half-decomposed entrails and heaps of manure were lying about. There was an offensive smell from the boiling-down, and the refuse from the vat was thrown out on to the ground. (When Mr. Le Capelain inspected, he found that this boiling-down has been discontinued.)

ST. KILDA ABATTOIRS.

Inspected on July 19th, 1888. Present—Mr. Akehurst, Prof. Masson, and the Secretary.

Site.—The St. Kilda Abattoirs are situated at the south end of Barkly-street, Elwood, near Point Ormond. The site is very low-lying, being almost the level of the Bay, and the soil is sandy. On the south side of the building is a stagnant pool receiving the drainage from the cattle-yards.

Area.—The area occupied by the buildings is about 60 by 40 feet.

Buildings.—The walls are of brick, about 12ft. high, lime-washed on the interior. The roof is of slate. The building is divided equally by a longitudinal wall; the north half is for sheep, the south half is for cattle.

Sheep Division.—The sheep-killing portion is divided into pens or compartments by wooden partitions opening into a central alley on their south side, and by doors into pens outside the building on the north side, where the sheep are kept preparatory to slaughtering. The floor of the alley is asphalted, with a fair fall to a central drain. The compartments and pens have flagged floors, which were very dirty.

The sheep are killed in the alley, their throats being cut over the drain; then they are skinned and dressed and hung in the compartments. They are hung very close together, the carcasses touching.

Cattle division.—The killing-place is at the south side. The floor is pitched, with crevices and deep interstices between the pitchers; it is not sufficiently sloped, and is very dirty.

The hanging-place adjoins the killing-place and has a flagged floor. The carcasses are hung very close together, being in actual contact.

The drainage.—The central drain from the sheep-killing place is asphalted, the drain from the cattle-killing place is pitched; both lead to a catch-pit just outside the west end of the building, sunk in the ground, bricked and cemented. This catch-pit is about 5 feet deep and about 5 feet in diameter. There is no overflow to this, and it receives all the fluid blood and washings from the whole place. It is emptied when full, and the contents taken in carts to Caulfield to be used as manure.

Treatment of offal.—All the offal and refuse is said to be carted away daily. The clotted blood is swept up and removed with the offal.

Ventilation.—The building is ventilated by louvres near the roof, and by the doors.

Accommodation yards.—The yards for the cattle are on the south-west side, and are about 100 x 50 feet in area. There are three divisions, and a water-trough in one division only. There is no shelter provided. The yards are pitched, and drain into the pool before-mentioned. Yan Yean is laid on; there are also underground tanks, where the roof-water is stored.

The yards for sheep are on the north-west side, and subdivided into five. One water-trough in one division only. Two yards, each 40 x 40 feet, are pitched. There are no shelter-sheds.

No pigs are kept. There is no boiling-down carried on, and no noxious trades exist near.

Number of stock slaughtered.—50 to 60 cattle, 500 to 600 sheep, a few calves and pigs, per week.

Cart-tracks were noted from the west door of the abattoirs down to the beach, but no offal or blood was noticed on the beach or in the water.

The premises generally were moderately tidy. They are owned by the Borough Council of St. Kilda, and let to Mrs. Edington, who has no lease.

The walls are lime-washed every Saturday; but the work is not thoroughly done, clots of dried blood being left adhering to the lower part of the walls of the killing-places.

COLLINGWOOD ABATTOIRS.

Inspected on May 23rd, 1888. Present—Mr. Akehurst, Prof. Masson, and the Secretary.

This establishment is owned by J. Woolcock, J. Feilding, and W. Davidson, and is for sheep only.

Site.—It is situated in Reilly-street, Collingwood, and occupies an area of 72ft. by 132ft.

Building.—The building is of wood. The floor is sloped to a central wood drain; on one side of the drain the floor is bricked, on the other side it is stone-pitched, the pitchers being grouted in cement, but the cement has been washed away in places, leaving interstices. A small strip of floor on one side of the bricked portion has been cemented, but the cement has become broken away, leaving depressions in which blood collects. The sheep-pens are under the same roof, the floors are stone-pitched, but were so dirty that the pitchers could not be seen.

Drainage.—The central drain is made of red-gum, and leads to a blood-pit, covered with a $\frac{1}{4}$ -inch iron grating, and there is a similar grating at the outfall drain from this pit, which discharges into the Reilly-street drain.

Treatment of blood and offal.—The pit is said to be emptied daily, and its contents, along with all other offal and refuse, carted to a farm at Doncaster.

Number of stock slaughtered.—About 2,000 sheep a week.

PRIVATE SLAUGHTER-YARDS OF W. ANDERSON AND CO., AT ESSENDON.

Inspected on April 24th, 1888. Present—Messrs. Akehurst, Hodgkinson, Girdlestone, Dr. McCrea, Prof. Masson, and the Secretary.

Site.—This establishment is situated on the bank of the Saltwater River, and is for sheep only.

Buildings.—The buildings are of wood. The floor of the killing-house is of brick, sloped to a central bricked drain. Ventilation is efficient.

Drainage.—The blood-drain passes to a cemented blood-pit. The washings are carried away by an overflow drain, partly cemented and partly wooden, and discharged into the river.

Treatment of blood and offal.—The fat, bones, and such portion of the offal as will yield fat are boiled down under pressure in closed vats, the steam from which is conducted by a pipe under the fire-bars of the furnace. The guts are removed by the sausage-skin manufacturers. The rest of the offal and the blood from the blood-pit are boiled in open vats, and then mixed with pollard or mill sweepings, to be used for feeding poultry.

No pigs are kept.

Number of stock slaughtered.—About 1,400 to 1,500 sheep a week.

The whole place was very clean and free from offence, with the exception of the boiling-down, where some smell was noticeable.

APPENDIX T.

DESCRIPTION OF THE ABATTOIRS OF BERLIN.

(Abstracted by the Secretary from the accounts of these buildings to be found in "Berlin and its Buildings," Architects' Society of Berlin, 1877, vol. II, pp. 250–255; and in "Report on the Local Administration of Berlin in 1877–1881," published in 1883, vol. I, pp. 124–128; which works were kindly lent to the Commission by the Commissioner for Germany at the Centennial Exhibition.)

There are about 870 private slaughter-houses in Berlin, butchers not being restricted to killing in public abattoirs.

The largest abattoirs in the city are in connexion with the cattle market, and are so extensive that the whole meat supply of Berlin could be slaughtered there. They are situated at the eastern end of the cattle market, and consist of two separate sets of buildings; only one of which has been so far used for slaughtering. This covers a space of 1·23 hectares.

The cattle slaughter-house consists of a higher central portion, 9·15 metres wide by 9·34 metres high; which is used for killing small stock and for hanging and cooling the meat. On each side of this are 16 compartments for killing cattle, each 9·39 metres by 4·87 metres, and varying from 5·55 to 6·79 metres in height. These are provided with strong wire lattice openings over the inner doors, for purposes of ventilation. All the paths of the slaughter-yard are paved with well-cemented clinkers, to prevent the blood soaking into the ground.

The blood obtained in killing is manufactured into albumen in a room for that purpose.

The overflow of blood, &c., runs with the cleansing water out of the various compartments into sink-holes, which are connected with the general drainage, and so arranged that all solid matter is there arrested and prevented from passing into the drain-pipes.

On the west and east of the building are stables for cattle, fitted with hay-lofts; and further east is the slaughter-house for pigs, 74·57 metres by 19·61 metres, fitted up with scalding vats, provided with hot and cold water. To allow the escape of the steam, portions of the ridge of the roof are furnished with lanterns, in which there are flaps opening from below. Next to this building are two sets of pens for the pigs that are to be slaughtered. The Berlin butchers clean and wash out the intestines in the killing compartments, and do not use the buildings provided for this purpose, which are used for storing tallow.

The fresh fat obtained at the killing is placed in closed iron digesters and melted by means of steam, the arrangements being of such a kind that no unwholesome or evil-smelling vapours are given off.

Additional slaughter-houses are built to the north, but are not in use at present. They resemble those described, except that there are cellars underneath, and it is proposed to have the central portion of these cellars made into refrigerating chambers, to which will be attached on either side rooms for storing the meat.

In the north-west corner, next the railway station, are situated the buildings for dealing with the secondary products of the abattoirs, viz., an albumen factory, tallow and margarine factory, and rooms for preparing and drying the guts before making them into sausage skins.

There is also a retail meat sale room, with cellars underneath in which to keep the meat.

The contagious diseases yard, for receiving cattle from districts suspected to be infected, is isolated at the extreme eastern end of the ground. It is reached by a flight of steps, and contains stabling for 120 cattle, with a slaughter-house and two killing-rooms; two apartments for the veterinary surgeon and the police butcher, and a morgue.

The police slaughter-house and observation stables are situated at the entrance to the abattoirs, and are used for killing diseased beasts and observing such as have got into the market improperly.

The cleansing water, as well as the water used in the slaughtering-rooms, together with that of the market and railway station adjoining, finds its way into underground clay pipes. It next discharges into a receptacle near the principal entrance to the market, the solid matter remaining behind. The drainage is then conducted by clay pipes into the southern arm of the Panke. The water used in the killing houses is thoroughly disinfected and rendered colourless before it goes into the receiving basin.

APPENDIX U.

ABSTRACT FROM THE REPORT OF THE BOARD OF HEALTH OF THE CITY AND PORT OF PHILADELPHIA FOR THE YEAR 1875.

SLAUGHTER-HOUSES.

Until recently slaughtering has been conducted exclusively in private slaughter-yards, but it was found that satisfactory inspection of these numerous establishments in widely separated localities was impossible. The driving of cattle through the streets, the stabling of cattle, the tardy removal of refuse and putrescible matters, the defiling of the drains by blood, and even solid substances are powerful objections against the location of any slaughter-house in a densely populated neighbourhood. Meat prepared in such places is liable to become tainted on account of the want of free ventilation, and the absence of facilities for most scrupulous cleanliness.

Hence it is contemplated to abolish all private slaughter-houses now that complete provision has been made in the new public abattoirs at West Philadelphia. The work of erecting these was begun in 1875, and by the early part of 1876 the buildings were sufficiently completed to be occupied, and the work of storing and slaughtering cattle has been in successful operation ever since.

The buildings are situated on the west side of the Schuylkill River, and the grounds occupy an area of 21 acres. The site is central, yet, to a considerable extent, isolated by the river and the extensive grounds of the Pennsylvania Railway Company.

In the rear, or along the west side of the premises, there is a railway track from which cattle are discharged. The track is so depressed as to bring the deck or platform upon the level of the storage pens. A railway track is also run eastward from this line for the delivery of sheep and hogs to that part of the premises set apart for these animals. This entire enclosure is laid out in streets, substantially paved with Belgian blocks, and lighted with gas.

For the storage of cattle there are 172 pens. These enclosures are plain frame structures, partly covered, in order to protect the animals from sun and storm, and are paved with granite blocks, and so graded as to secure quick and complete drainage. Each apartment is provided with feed and water-troughs. The telegraph anticipates the arrival of each train of animals, thus enabling the superintendent to designate and prepare the apartments for their occupancy, with the required rations of forage and supply of water, so that they are on their arrival at once made comfortable by food and rest after their long journey. This department has a capacity for the comfortable storage of 7,000 head of cattle, and is provided with all the necessary requirements, as hydrants, fire-plugs, and hose, in order to insure safety, comfort, and cleanliness. The enclosures for the storage of sheep occupy the northern end of the premises. They consist of two frame structures, 350 feet by 130 feet, covered with a gravel roof, and provided with a granite pavement. These buildings are divided into compartments and pens for wholesale and retail storage, and have the necessary scale enclosures. Streets and alleys divide premises at convenient distances. Each storage pen is provided with a rack for fodder and troughs for water. The entire division affords capacity for the comfortable storage of 10,000 sheep.

The hog department is just east of the sheep enclosure. Every provision has been made to ensure cleanliness and facilitate the thorough renovation of this part of the establishment, and at the same time preserve ventilation and the free circulation of air. The roof of the building is supported by wrought-iron columns, and light iron railings are used in making the subdivisions. The wide openings at the sides admit a free current of air. Another important feature, from a sanitary point of view, is the means devised for securing thorough drainage. For this object the floors are laid with Belgian blocks grouted in cement, and slightly inclined from either side toward a central depression along which fresh water constantly flows, thus providing against the possibility of offensive accumulation. These animals are also provided with all the comforts of food, water, &c. This section of the yard is likewise laid out with streets, lanes, and passage-ways, and is divided into large and small enclosures for general and special storage, and is provided with scales and all the necessary conveniences for the accommodation of buyers and sellers.

Centrally located, and upon one of the broader avenues, is the office and exchange building. This is a brick structure, two stories high, and 100 feet long, by 40 feet in breadth. The lower floor is divided into telegraph, post, and business offices. On market days this building presents all the activity of the stock or gold exchange.

Close adjoining the exchange building is a range of offices for the use of the dealers in sheep and hogs. There is a brick stable on the premises, 31 feet by 115 feet, for the storage and sale of horses.

Immediately adjoining these buildings is a covered enclosure for the accommodation for 500 cows and calves. This enclosure is also well paved and drained, and provided with all the conveniences for watering and feeding the animals. Large platform scales for weighing the stock are situated at convenient localities about the premises.

The abattoirs is a highly ornamental brick building, with a frontage on the river of 110 feet, and running back 195 feet. The nature of the ground rendered it necessary to lay the base of the foundation upon heavy timbers and concrete, upon which stone masonry is built up to the level of the ground. Above this the walls are of brick. The main floor (which is four feet above the level of the ground) is supported by cast-iron columns. The roof is supported by two rows of wrought-iron columns which divide the building into a central aisle 50 feet in width, and side aisles each 30 feet in width. The central aisle is open to a height of 40 feet to the eaves, and is covered by an arch roof erected on a new principle of construction that previously has seldom been used, the rafter being cut to the curve of equilibrium for a uniform load. The side aisles have a height of 20 feet to the square, and the rafters have also base curvatures. The building is provided along its sides with a series of doors 6 feet wide and 15 feet apart, to allow of the loading of the meat into waggons. Over each of these doors is a transom for the admission of air and light. The centre aisle has a large clear window which can be opened and closed, and also a ridge roof ventilation. The great essentials of air and light are thus provided for. The basement, eleven feet in depth, extends under the whole building. The main and basement floors are covered with Philbert's patent asphaltum pavement,

four inches thick, and sloped so as to insure perfect drainage. The upper or main floors are used exclusively for the slaughtering of cattle. On each side of the middle aisle, and immediately adjoining it, is a range of pens enclosed by an iron pipe railing, which are provided with gates opening upon the centre aisle, and from thence into the slaughtering pens. Along the outside of these pens, running the entire length of the building, is the slaughtering floor, which is laid with heavy yellow-pine planks, and canked in the same manner as a ship's deck. Opposite each slaughtering pen are the apparatus (all of the most approved patterns) for hoisting the carcasses, and a range of baulks or beams for the hanging of the dressed beef. Each slaughtering division is provided with hose, and hot and cold water for the use of the butchers. Men are in constant attendance upon the butchers, whose duty it is to catch the blood and to immediately remove it and the refuse to that part of the building used for the utilization of these substances. This vast slaughtering floor has a capacity for killing and dressing 1,200 oxen per day. For the comfortable heating of the building in winter a range of steam pipes has been placed against the outer walls between each of the doors.

The basement of the west end of the building is arranged for the slaughtering of sheep. A range of elevated pens has been erected, which are enclosed by an ornamental wire fence supported by cast-iron posts, and provided with a floor of stone flagging. Running along the front of these pens is a stone table, with a galvanized-iron gutter immediately beneath it, for the slaughtering of the sheep and the gathering of the blood. The space occupied by the butchers in this apartment is paved with cement; it is open, roomy, and light, and has a capacity for the slaughtering and hanging up of the carcasses of 3,000 sheep.

The east end of the basement, or lower storey (for at the end next to the river the floor is level with the surface of the ground) is occupied by the engine and boiler room, and by the apparatus used for the rendering of the tallow and the utilization of the blood and the other animal matters. Here are placed the boilers of one hundred horse steam capacity, and an engine of sixty horse power.

The most interesting and novel feature of the machinery department, however, is the apparatus for rendering tallow and utilizing refuse. Placed upon pillars are two horizontal cylindrical tanks or boilers 5 feet in diameter and 15 feet long. These tanks have each three 16-inch openings or manholes, two in the upper, and one in the lower side. They are elevated so that the upper openings in each of these tanks are on the level of the upper or cattle slaughtering floors.

In each of these tanks there is a shaft provided with radial arms and a broad bar running along the inner walls of the vessel. The shaft passes through the end of the tank, and is provided with a stuffing-box, and at the end with a gear-wheel, which is connected by a shaft, belt, and pinions with the engine. The tanks are jacketed or surrounded with a steam space of three inches in width. As soon as the slaughtering is finished each day, the rough fat is carried in trucks and placed in one of these tanks; steam is then passed into the surrounding space, and in four hours the tallow is rendered from the tissue. Water is then introduced into the bottom of the vessel, the melted tallow elevated and passed through a dome in the top, and from thence through a pipe, and carried some fifty feet into the centre of the basement to the necessary vat, from whence, after settling and cooling sufficiently, it is run into casks or commercial packages. In the pipe used for decanting the tallow there is a glass section that brings to the view of the person in charge the exact condition of the material passing over, thus enabling him to determine the moment of the displacement of the tallow. When all of this product is discharged, the water is drawn out from the tank through the large pipe at the base, and carried to the bottom of the river. As soon as the water is run off the refuse of the slaughtering floor is put into the tank and subjected to the rendering process, and all the fatty matter extracted therefrom in the same way as the first. The water is then run off, and the blood accumulated during the day is put into the vessel with the refuse resulting from the two rendering processes; the tank is closed up, steam turned into the jacket, the shaft and arms put into motion, and the process of drying commenced. The steam generated by the heated walls passes from the tank through a four-inch pipe and is delivered at the bottom of the river, thus thoroughly condensed and rendered harmless.

The animal matter is thus dried, and by the constant heating of the revolving arms rendered pulverulent. As it is poured out of the apparatus it has the consistency, dryness, and appearance of ground coffee, and, strange to say, these several operations are performed with this machine without a breath of odour, and without any of the noxious emanations that have always accompanied these operations, thus rendering the tallow and turning the residuum known as scraps, together with the blood, into a useful and profitable product, without offence. This apparatus is the invention of Dr. J. J. Craven, of Jersey City, who has given his attention, since the war, to improving the sanitary condition of slaughtering establishments, and the utilization of animal matter.

APPENDIX V.

EXTRACTS FROM RULES OF BOARD OF HEALTH OF PHILADELPHIA.

SLAUGHTER-HOUSES.

213. All slaughter-houses located within the city not having *the floors* paved with asphalt or some other impervious material, properly sloped to a well-trapped and permanently-grated inlet having a direct communication with the sewer; or not having the *walls* covered to a height of 7 feet with smooth impervious material; or not having graded, paved, and well-drained *yards*, or that are unprovided with adequate *water supply*, and a suitable arrangement of hose or pipes to enable the walls, floors, and yard to be *effectually washed*; or not having the floors and walls of *apartments in which animals are kept* previously to slaughtering, likewise covered with asphalt, or some other impervious material; or not being *ventilated* by openings on to the public ways or other places, or by the roof, are hereby declared to be nuisances prejudicial to public health; and the owners, agents, or occupiers shall be required to abate such nuisances within ten

days from the date of notice. Should this not be done the health officer is hereby directed to effect the abatement of the nuisance at the expense of the owner, and to prosecute the parties for the penalty of maintaining a nuisance.

214. No blood pit, dung pit, offal pit, or privy well shall remain or be constructed within any slaughter-house.

Any one offending against this rule shall be guilty of creating and maintaining a nuisance prejudicial to public health, and shall be required to remove the nuisance within ten days from the date of notice. Should this not be done, the health officer is hereby directed to effect the removal at the expense of the owner, and to prosecute the parties for the penalty of maintaining a nuisance.

215. The owners, agents, or occupiers of all slaughter-houses located within the city, except those in rural portions thereof, are required to provide movable receptacles, with tightly-fitting covers, for the purpose of receiving and conveying away blood, offal, filth, and other offensive matter, and these matters are to be deposited in the receptacles immediately after the slaughtering, and removed with all fat, hides, skins, tripe, and bones, daily, between the hours of 7 p.m. and 7 a.m. during quarantine season, and at least twice a week, between 6 p.m. and 8 a.m. during the other parts of the year. No blood and offal shall be permitted to flow into the sewer. Any one violating these regulations shall be prosecuted for the penalty of maintaining a nuisance prejudicial to public health.

REGULATIONS FOR BONE-BOILING ESTABLISHMENTS AND DEPOSITORIES OF DEAD ANIMALS.

220*a*. No bone-boiling establishment, or depository of dead animals, shall be kept or erected within the limits of the City of Philadelphia, without a permit from the Board of Health, and for each permit so granted a charge of ten dollars per annum shall be made, but no permit shall be granted for any bone-boiling establishment, or compost manufactory, or depository of dead animals, within the First, Twenty-fourth, Twenty-sixth, Twenty-seventh, and Thirtieth Wards, which are prohibited by Acts of Assembly.

b. No permit shall be granted to any person or persons to carry on the business of boiling bones and dead animals, until after a careful inspection of the locality, buildings, apparatus, and the plans for conducting the business, and the approval of the Sanitary Committee.

c. No bone-boiling establishments and depositories of dead animals shall be kept or erected in or near to a thickly-inhabited neighbourhood.

d. The floors of all bone-boiling establishments, and depositories of dead animals, shall be paved with asphalt, or with brick or stone well laid in cement, or with some other impervious material, and shall be well drained. All such establishments shall have an adequate water supply, and a proper arrangement of hose or pipes, as will enable thorough cleanliness to be maintained.

e. The boiling of bones and dead animals, &c., shall be conducted in steam-tight kettles, boilers, or cauldrons, from which the foul vapors shall first be conducted through scrubbers or condensers, and then into the back part of the ashpit of the furnace fire to be consumed, or by other apparatus equally efficient in preventing or counteracting the offensive effluvia.

f. When bones are being dried after boiling they shall be placed in a close chamber through which shall be passed, by means of pipes, large volumes of fresh air, the outlet-pipe terminating in the fire-pit.

g. All proprietors of bone-boiling establishments not having permits to carry on the business, and violating these regulations, shall be fined fifty dollars "for every such offence, and for each month's continuance of the same after notice," and also be liable to indictment at common law for creating and maintaining a nuisance.

h. The Permit Clerk shall have provided a book in which to enter the names of all persons engaged in the business of boiling bones, and having depositories of dead animals; also, the location of works and appliances as reported by the medical inspector, whether licensed or not, the number and date of permit, and remarks.

206. The business of bone and horse boiling shall not be allowed, except in sparsely settled rural districts, subject always to the judgment of this board; and under no circumstance shall it be allowed, unless conducted under cover, the building to be provided with smoke consumers, and a due regard be had to cleanliness in the disposition of the offal.

207. That the keeping of hogs (fed upon garbage or other offal) in large numbers, in certain sections of the city of Philadelphia, is a nuisance prejudicial to public health, and that the same be and is hereby prohibited except in certain defined districts:

Provided, however, that in other rural sections of the city and county of Philadelphia persons engaged in the cultivation of land may be permitted to keep a few hogs for their own use, if not fed upon garbage or other offal, and are kept in such condition as not to create a nuisance:

And provided that the owners thereof shall register their names and the location of premises whereon hogs are kept with the Chief Inspector of the Board of Health. That whenever a complaint is made of a nuisance existing by reason of the keeping of hogs within the boundaries where they are permitted to be kept, the complaint shall be referred immediately to the Chief Inspector, who shall cause an examination to be made, and he shall report all the facts, in writing, to the board for its action.

APPENDIX W.

EXTRACTS FROM GENERAL ORDERS OF THE BOARD OF SUPERVISORS RELATING TO THE PUBLIC HEALTH, SAN FRANCISCO.

ORDER No. 1587.

Section 2. No person shall establish or maintain any slaughter-house, slaughter cattle, hogs, calves, sheep, or any other kind of animals; pursue, maintain, or carry on any other business or occupation offensive to the senses, or prejudicial to the public health or comfort, within the limits of the city of San Francisco, except within that tract of land described as follows:—Commencing at the intersection of the

easterly line of Kentucky street with the south-westerly line of First avenue; thence south-easterly along the south-westerly line of First avenue to the north-westerly line of 1 street; thence south-westerly along the north-westerly line of 1 street to the south-westerly line of Seventh avenue; thence north-westerly along the south-westerly line of Seventh avenue to the south-easterly line of Railroad avenue; thence north-easterly along the south-easterly line of Railroad avenue to Kentucky street; thence northerly along the easterly line of Kentucky street to the south-westerly line of First avenue and place of commencement.

Within the tract of land last aforesaid no person shall keep any number of hogs or other animals in such a manner as to be offensive to the senses or prejudicial to the public health or comfort.

No person shall render tallow within the limits of the city and county of San Francisco, except within the tract of land bounded and described as follows:—Commencing at the intersection of the easterly line of Kentucky street and the south-westerly line of First avenue; thence south-easterly along the line of First avenue to 1 street; thence south-westerly along the north-westerly line of 1 street to the bay shore; thence westerly along the bay shore to the south-easterly line of the Railroad avenue; thence north-easterly along the south-easterly line of Railroad avenue to Kentucky street; thence northerly along the easterly line of Kentucky street to First avenue and place of commencement.

ORDER 1601.

GENERATING OF UNWHOLESOME ODOURS.

Section 20.—The rendering, heating, or steaming of any animal or vegetable product or substance generating noisome or unwholesome odours or gaseous vapours shall be conducted in steam-tight kettles, tanks, or boilers; and such method adopted as shall entirely condense, decompose, deodorize, or destroy the odours, vapours, or gaseous products. And no person shall be permitted to burn upon his premises, street, alley, or other places, any animal or vegetable substance which will create noisome or unwholesome odours.

APPENDIX X.

NOXIOUS TRADES IN NEW YORK.

Health Department,
New York, 24th July, 1888.

Mr. G. A. Syme, Secretary Royal Sanitary Commission, Melbourne.

SIR,

His Honour the Mayor of New York has transmitted to me your letter of 28th May, asking for certain information relative to the rules enforced in this city for the regulation of abattoirs, offensive trades, &c., also the manner of dealing with such nuisances, and what are required to keep them in good condition.

The rules of this department relating to these and nearly all other subjects affecting the public health are summarized in its Sanitary Code, a copy of which I have pleasure in sending you.

The enforcement of the provisions of this Code constitutes our work in general, and its several provisions will, I think, answer all your inquiries as to construction and management.

I regret to say that the business of slaughtering animals in this city is, unfortunately, in close proximity to a populous neighbourhood. Some years ago a place on the East River, at the foot of an apparently impassable bluff, was selected; and there, by permission of the board of health, the principal slaughter-house interest of the city was centered. There were, at that time, no residences in the immediate neighbourhood. Since then, however, they have been built so solidly to the edge of the bluff that, as a consequence, the odours, and even the smoke from the chimneys, of these establishments give great annoyance to citizens. It is but fair to say, however, that the land was bought cheaply, in consequence of the existence in the neighbourhood of so many slaughter-houses and abattoirs, and that the principal complaint now comes from those who, having bought this cheap land, desire to see it appreciate rapidly in value. The evil, however, is one which will in time correct itself. The business is gradually going up in New York City, from the competition of refrigerated meats sent from the west, and in a few years it is doubtful if any considerable business in the slaughtering of cattle will be found in New York.

Our manner of dealing with the rendering of offal, the drying of blood, &c., is, in my judgment, the only way in which satisfactory results can be reached. We decline, in any case, to prescribe how these materials shall be treated, or what apparatus shall be used; but we notify the persons engaged in this business, who have to work under permits of this department, that their business must be conducted without nuisance of any kind, and that, if this is impossible, we will promptly revoke their permits. This leaves it to the persons interested to find the method; and, as a rule, they do it better than we could do it for them. My experience in public sanitary work leads me to believe that the moment a department prescribes a rule or method of procedure it relieves those upon whom the order bears from a very large part of the responsibility that would otherwise rest upon them, since a perfunctory compliance with the letter of the requirements seems to be about all that can be secured. Our method is the broader one of saying to the person engaged in this business—"Do it in your own way, and provide what apparatus you see fit; but your place will be watched, and, on the first well-founded complaint that it is a public nuisance or a source of annoyance or danger, we will cancel your permit; and if you work without it, you will be in danger of penalties prescribed by law." The result is that there are but two establishments in New York which treat organic refuse. Both are models in their way, and are as free from offence as is possible in the case of such establishments. All that cannot be treated in these establishments is removed, by the offal contractor, to his works—remote from the city.

Respectfully,

JAMES C. BAYLES, President.

APPENDIX Y.

San Francisco, 3rd August, 1880.

To the Secretary, Royal Sanitary Commission, Melbourne.

DEAR SIR,

In reply to your letter of inquiry, I would say—1st, we have no municipal or official abattoir in this city; the slaughter-houses all belong to private parties; they are located in a group in a distant suburb, and are built on piles over a reach of the Bay of San Francisco. In the matter of drainage, dealing with offal, &c., the proprietors follow their own sweet will, by dumping the same into the bay. I send you by this mail a copy of the health and quarantine laws of this city, which will answer your questions as to how we prevent nuisances from noxious trades, and how we dispose of the excreta and refuse of the city. Most of the city is sewered, and the dwellings connect with the sewers. Where, as in the suburbs, there are no sewers, there are cesspools, which are emptied at prescribed times by the apparatus of the "Odourless Excavating Co.," which cleans them effectively, without offence to the community.

I am, very respectfully,

E. B. POND,
Mayor of San Francisco,
per A. J. MOULDER, Secretary.

APPENDIX Z.

ABSTRACT OF REPORT BY ARTHUR G. KENWAY ON THE TREATMENT OF NOXIOUS WASTE LIQUORS FROM ABATTOIRS.

A successful process must be simple, rapid, and cheap, and produce a saleable manure.

1. For towns or thickly-populated neighbourhoods a precipitation process is the best. Four gallons of a saturated solution of alum to every 100 gallons of the liquor answers well. When well stirred, the mixture should be run into a conical settling-vat, having small observation glasses let into its side, and with taps at various levels for decanting the clear liquid. This is then to be run through a bed of coal ashes, from which it will emerge colourless and innocuous. The mud left in the vat can be desiccated or, more profitably, mixed with dry coal ashes, and then forms a convenient manure. If the liquid manure from sheeps' paunches were desiccated, and mixed with the precipitate, it would form a high-class manure, provided the temperature was sufficiently high to destroy the germs of noxious weed seeds which this material contains.

2. For country districts, the waste liquor can be utilized to irrigate the soil, by distributing it in a diluted form over the ground from watering-carts; or the concentrated soup could be mixed with coal ashes, and the water that drains away distributed over the land, the ashes forming a valuable manure when dried. If dried by spreading in a thin layer on a covered floor, no nuisance would arise. These simple processes are applicable to the waste liquors from all noxious trades, and there is no necessity for the existence of any nuisance in connexion therewith.

APPENDIX A1.

AMERICAN CHILLED MEAT.

REPORT OF THE U.S. COMMISSIONER FOR AGRICULTURE.

The Hon. Jas. D. Porter, Assistant Secretary of State, Washington, D.C.

SIR,—Your favour of the 2nd ultimo, enclosing a despatch from Mr. G. W. Griffin, U.S. Consul at Sydney, New South Wales, requesting information relating to the subject of "Chilled Meat," which had been requested by the Premier of that colony, was duly received. The information desired occasioned considerable correspondence with parties engaged in the dressed meat business, and this must be my apology for any apparent delay in replying to your request. In the following pages and accompanying enclosures, I think, will be found the answers to the questions propounded by Mr. Griffin:—

The Dressed Meat Traffic.

1. By whom is the dressed meat traffic conducted, and how?—The dressed meat traffic in the United States is conducted almost exclusively by firms employing large amounts of capital and many men in the work.

The greater part of the slaughtering is done in Kansas City, Mo.; Omaha, Nebraska; St. Louis, Missouri; and Chicago, Illinois. (These places are from 1,000 to 1,500 miles from the seaboard and eastern markets.) All of these places are centres to which the live stock of the western and middle states are sent for sale. The slaughter-houses are, in nearly every instance, near the stock-yards in which the animals to be slaughtered are received from the railroads, and are fed, watered, and sold, or shipped to other markets. Firms engaged in the dressed meat traffic employ professional buyers, who receive liberal salaries for their services, because of their ability to judge accurately of the weight and quality of the animals offered for sale. In all cases the cattle or sheep are weighed after purchase, the price per cent. having been first agreed upon by the purchasers and sellers. The scales are so arranged that from 50 to 80 cattle may be weighed together upon the platform.

Within the last two years an abattoir has been established on the line of the Northern Pacific Railway in Dakota (1,500 miles from Bolton), for the purpose of killing cattle grazed and fattened on the range near the abattoir, and of sending the beef from such cattle in refrigerator cars or vans to the markets of the Eastern States, and of Great Britain, and the Continent.

2. In what part of the States is it carried on?—Chiefly Eastern Kansas, Nebraska, Missouri, and Illinois. At Kansas City large numbers of cattle, sheep, and swine are received from Arizona, Colorado, New Mexico, Texas, the Indian Territory, Kansas, and Missouri. At Omaha live stock from Idaho, Utah, Wyoming, Kansas, Dakota, and Nebraska are received. The stock so

received is either sold to resident buyers, who slaughter in houses in the towns named, or who ship to other markets further east, or the animals are forwarded to those other markets without having been sold. Agents of the refrigerator car companies are called upon to furnish cars for a large number of western points, some of them in the heart of the range country where grass-fed cattle are cheap and abundant. Cattle that could not endure the hardships of transportation "on the hoof" can be shipped in refrigerator cars with profit.

3. Is the business carried on to the same extent all the year round, or more at one season than another, and if it varies, why?—This business is carried on throughout every month, and the traffic is extending each year into more distant parts; the extent of the trade depending largely upon the available supply of cattle and not upon the condition of the weather, for heat or cold seems to have little effect upon the volume of the business. In the winter here it is as necessary that the meat shall be kept from freezing as it is that it shall be protected from the effects of the heat in the summer. The receipts of dressed beef at New York City may be taken as showing fairly the volume of the traffic month by month throughout the year, therefore the subjoined statement has been prepared. As the greater part of the traffic in dressed meat has its origin in Chicago, another statement has been prepared showing the number of tons of 2,000 pounds sent to the eastern markets by Chicago houses. That question (No. 18), "What proportion does the dead meat trade now bear to the fat stock trade?" may be answered at the same time in convenient form. I have included in that table shipments of cattle from Chicago to the same eastern market for the same years:—

STATEMENT of Tons of Dressed Beef received at New York between January 1, 1882, and December 31, 1885—by months.

| Months. | 1882. | 1883. | 1884. | 1885. | Average. |
|------------------|-------|--------|--------|--------|----------|
| January | ... | 1,201 | 1,913 | 3,643 | 2,252 |
| February | ... | 1,555 | 1,846 | 3,246 | 2,216 |
| March | ... | 1,590 | 1,937 | 3,564 | 2,364 |
| April | ... | 1,311 | 1,960 | 4,593 | 2,621 |
| May | ... | 769 | 3,176 | 4,237 | 2,727 |
| June | ... | 748 | 3,122 | 4,074 | 2,648 |
| July | ... | 929 | 3,024 | 4,050 | 2,665 |
| August | ... | 1,321 | 3,187 | 4,577 | 3,028 |
| September | ... | 1,670 | 3,526 | 5,392 | 3,529 |
| October | ... | 1,783 | 3,941 | 5,638 | 3,787 |
| November | 1,283 | 1,569 | 3,555 | 4,953 | 3,770 |
| December | 1,400 | 1,919 | 3,769 | 5,377 | 4,155 |
| Total | 2,683 | 16,365 | 34,956 | 53,344 | 36,824 |

In July of each year, cattle from Texas and the plains of the south-west generally begin to reach the great live stock markets named above. The arrivals generally increase in number until they are joined in August, and later by cattle from the ranges of the States and territories further north. The receipts of the plains cattle continue until December, at which time the supply from the plains ceases; but its place is at once occupied in the market by the stock which has fattened on the grass of the pastures of the States east of the Missouri River.

Comparative Statement.

SHIPMENTS of Cattle and Dressed Beef during Calendar Years 1880-85, inclusive, from Chicago.

Tons of 2,000 lbs.

| Destination. | 1880. | 1881. | 1882. | 1883. | 1884. | 1885. |
|--------------------------|---------|---------|---------|---------|---------|---------|
| New York City— | | | | | | |
| Cattle | 222,262 | 265,367 | 257,281 | 238,828 | 191,736 | 182,199 |
| Beef | 114 | ... | 3,812 | 23,160 | 32,722 | 45,112 |
| Boston— | | | | | | |
| Cattle | 81,914 | 96,222 | 56,391 | 75,689 | 54,845 | 39,931 |
| Beef | 9,860 | 14,405 | 18,683 | 29,139 | 29,644 | 37,724 |
| Philadelphia— | | | | | | |
| Cattle | 19,280 | 30,403 | 36,137 | 20,225 | 15,759 | 23,235 |
| Beef | ... | ... | 475 | 9,033 | 14,209 | 22,825 |
| Baltimore— | | | | | | |
| Cattle | 4,053 | 3,807 | 5,085 | 8,167 | 8,211 | 6,916 |
| Beef | ... | ... | 1,393 | 4,160 | 4,208 | 7,676 |
| New England States— | | | | | | |
| Cattle | 45,145 | 12,021 | 146 | 1,003 | 1,151 | 2,587 |
| Beef | 20,845 | 29,227 | 38,672 | 52,936 | 53,066 | 60,252 |
| New York State— | | | | | | |
| Cattle | 39,632 | 22,908 | 21,778 | 14,491 | 16,995 | 7,262 |
| Beef | ... | 18 | 907 | 16,605 | 24,552 | 25,506 |
| New Jersey and Delaware— | | | | | | |
| Cattle | 1,560 | 1,017 | 1,664 | 1,558 | 584 | 199 |
| Beef | ... | ... | 630 | 6,237 | 10,619 | 14,041 |
| Pennsylvania— | | | | | | |
| Cattle | 1,050 | 1,283 | 2,584 | 3,838 | 18,590 | 15,863 |
| Beef | ... | ... | 370 | 5,893 | 8,746 | 9,488 |
| Maryland and South— | | | | | | |
| Cattle | 1,308 | 572 | 2,594 | 8,415 | 4,539 | 2,830 |
| Beef | ... | ... | 878 | 2,557 | 5,545 | 7,701 |
| Eastern Canada— | | | | | | |
| Beef | ... | ... | ... | ... | 1,592 | 1,359 |
| Cattle | 416,204 | 433,600 | 383,660 | 372,214 | 310,410 | 281,022 |
| Beef... .. | 30,819 | 43,774 | 65,775 | 149,640 | 184,993 | 231,634 |

4. Do those engaged in it carry on the trade on their own account as dealers in stock or in meat or as agents for others? If as agents, on what terms?—This trade is in the control of firms using their own capital, owning the slaughter-houses, and in some cases the refrigerator cars used in the business. These firms buy, kill, transport, and in some cases even retail their meat to the consumers. At the termini they have built and own cold storage rooms for their own uses, and are in almost every way independent of all outside dealers or agents, so far as concerns the buying of cattle in the west, the selling to the actual consumers in the east, and all intermediate transactions necessary to the business, except the hauling of the refrigerator cars over the railways. I do not intend to convey the idea that the firms in the business do sell large quantities of their meat to the consumers, for they do not; but they are able to do so at any time. They do not carry on any part of the business as agents for others.

5. How are the stock awaiting slaughter kept?—Beefes and sheep are bought from day to day at the stockyards named above; the supply is scarcely ever below the needs of the shippers of dressed beef or mutton, therefore, there is never any need of keeping a supply on hand for the next coming day. On arrival in the stockyards, usually at an early hour in the morning, the stock receives hay; after eating the hay they receive water in practically unlimited quantities. They are then, if sold, weighed and delivered to the buyer. His assistants drive the stock to the slaughter-houses near, and there they are killed, very often almost immediately after arrival at the slaughter-houses.

6. Describe the yards, slaughter-houses, and appurtenances, sending plans and lithographs where procurable.—The stockyards of Chicago are the largest in the world, and may be considered representative yards; but they are perhaps less perfectly planned than are those built at a comparatively recent date in Kansas City, Missouri. The latter are on the sandy bank of the Kaw River, to which the drainage of the yards flows freely through the sewers of ample size. These sewers underlie nearly every street in the yard, as their branches underlie nearly every alley. The area covered by the yards is divided by streets and alleys

into blocks as nearly square as the nature of the ground permits. The blocks are subdivided into pens of various sizes by fences made of strong cedar posts deeply planted in the earth, and of pine planks 2 inches thick firmly nailed to the posts. The planks are 6 inches wide, and are surmounted by a broad plank 2 inches thick extending along the entire length of the fences including the tops of the many gates. This broad plank thus affords a continuous walk from one part of the yard to any other part, high above the ground. At frequent intervals elevated bridges span the streets and alleys, that there may be no necessity for descending to the level of the ground. To each block a letter is given to distinguish it from the others, as block "A," &c. To each pen in a block a number is given. When a lot of stock is put into a pen a record is made on the books of the company operating the yards, as for illustration, if a car load of cattle was received for John Doe, the record would read: "16 cattle, John Doe, lot 34, block G." At convenient places in the yards scales are placed for weighing the stock. These scales are made expressly for this purpose, and are each covered by a substantially built house. Of their capacity something has been said above. The pens are floored with pine planks 4 inches thick, resting on other planks of like description. The latter rests in turn upon their edges upon planks lying upon the ground. In places where the pens are not so floored, they are paved or macadamized. For cattle-pens no roofs are provided, but pens for sheltering hogs and sheep are roofed. In every pen is a water-trough of ample size, filled, when desired, from cocks in pipes connecting with a water-tank. In Chicago the water supply is taken from a stand-pipe, 100 feet in height and 7 feet in diameter. This pipe is filled by engines driving strong pumps, taking their supply from artesian wells, some 1,200 to 1,300 feet deep. The stock-yards of Chicago cover 360 acres. The slaughter-houses are of brick. From the stock-pens at one side of the houses, an inclined plane, 7 or 8 feet wide, extends to the height of the second floor. Between the side of the building and the drive-way mentioned is a row of pens, each 8 feet long and 4 feet wide. Each of these pens connects by a strong door with the drive-way, and at the other end is another door covered by a plate of iron, through which door access can be had to the interior of the slaughter-house. In the operation of the business cattle are driven up the inclined plane to the level drive-way, and a gate closes behind them. The gates of the small pens are open, and the cattle naturally enter to escape the crowd and the shouting drivers behind. Only one animal, or at the most two small beasts, can enter one of these pens at a time. The door is closed behind the animal, and it finds itself imprisoned in a space so small that it cannot turn itself around, but must stand with its nose close to the ironclad door, beyond which are the butchers. Over the heads of the beast awaiting death is a running board or walk 1 foot wide. Along this goes a man armed with a rifle carrying a ball 44-100 calibre, or with a piece of iron pipe $\frac{3}{4}$ -inch in diameter, in the end of which a lance-shaped point has been fastened. With the rifle placed within a few inches of the head of the animal the trigger is pulled, and the heavy ball tears its way through the *medulla oblongata* and the brain, or if the lance is used, the spinal cord is severed by its sharp edge; either way causes instant death. The ironclad door is raised when the butchers within are ready, and a chain is passed around the horns of the beast. This chain is operated by a steam engine, and quickly drags the bullock into the dressing-room, where it lies upon a floor sloping slightly toward a gutter through which runs a stream of water, carrying away all the blood and offal that is not saved in the operations of slaughtering. When the throat of the bullock is cut, the blood is caught in shallow pans and saved. The skin is quickly stripped from the warm carcass, which is then hoisted by steam machinery, split along the backbone, and the sides, hanging by hooks depending from wheels running up a suspended rail of iron, are pushed in the cooling-room, there to hang until their temperature shall have fallen to that of the outer air. The sides are then taken to the chill-rooms to be kept until they shall be ready and wanted for shipment.

7. What is the cost of slaughtering the stock?—No definite answer can be given to query No. 7, for the reason that so many elements enter into the cost that it is quite impossible for any one not having access to the books of the slaughterers to arrive at it. The cost varies, being less in some houses having the best appliances and superior management than it is in smaller or less completely appointed establishments, or large ones not so nicely managed as others. Those engaged in the business naturally object to telling what the cost is of their operations.

8. Are beasts slaughtered at a price for their owners,—if so, at what rate?—As a rule, animals are not so slaughtered. It is said, however, that it is the intention of those who have recently started slaughtering establishments in the plain country of the west to slaughter for any and all who may bring them a carload or more at a time for that purpose.

9. Are fat, tongues, or the offal taken by slaughterers as part payment for their work?—This query is answered by the reply to No. 8.

10. Describe the chill-rooms,—how they are built, and of what material?—Chill-rooms are prepared by making next to their walls, a dead air-space, as nearly air-tight as possible. In some of the rooms racks or cribs rise from the floor of the room to that of the room next above. These cribs are filled from time to time with ice, traps in the floor above being opened for that purpose. Means for ventilation are provided at the top of the chill-room. In most chill-rooms, and in cold storage houses in the north, naturally-formed ice is used; but in the cold storage houses in the south artificial means are used for reducing the temperature. They are of brick or of wood.

11. Describe the cooling machinery, and state which is the best?—Without personal experience of the workings of the different kinds of refrigerating machinery, I would not be competent to decide as to which is the best adapted to the purposes of the dressed beef business.

12. What are the modes, extent, and cost of cooling meats per pound or per carcass?—Without knowing the cost of ice, of coal, or other fuel, and the other elements of cost, it would be difficult to answer the question quoted, and the operators are as reluctant about answering this as they are about answering other queries as to the cost of the several operations necessary to their business. The cost of the operation may be ascertained approximately from the statements of the makers of cooling machines in the circulars sent herewith.

13. Describe the van by which the meat is carried by rail, the mode of sending it, and give full details as to how cold is provided on the way where necessary and the cost?—Several different cars are used for the purpose of carrying fresh meats long distances by rail; of these the oldest in use is that invented some twenty years ago by Mr. Wm. Chandler. Since that gentleman put the first refrigerator car into service hundreds of patents have been taken out in the United States for devices of the kind. Of these none are more generally used than is the one known as the Tiffany refrigerator car. As at present constructed these are 30 feet long inside, and provided with hooks for suspending the fore and hind quarters into which the meat is cut just before it is placed in the car. In the top of the car are ice boxes, which are filled with ice before the meat is placed in the car. The car is closed as quickly as possible after the meat is placed in the car. From thirty to sixty minutes are required in loading a car with 20,000 lbs. (20,000 lbs. would be equal to twenty-five bodies) of beef quarters, four men clad in white frocks doing the work. While hanging in the cooling or chill-room the meat is usually in halves or sides, and is cut apart by workmen as it leaves the hook on the scale where it is weighed at the place of loading. The ice tanks are examined two or three times on the way from Chicago to New York or Boston, or once in twenty-four or thirty-six hours, and, if necessary, are replenished with ice and salt. The larger concerns attend to this at their own expense, having ice and men ready at the stations where required. The cost depends upon the condition of the weather at the time the beef is in transit and also at the time of putting up the ice used. In a favorable winter ice can be housed in the north for less than one dollar per ton. From 1,000 to 1,200 lbs. are placed in each car, the quantity depending on the season. During the hottest part of August last, dressed beef was sent from Chicago to New York and to Boston in cars in which 900 lbs. of ice were placed at Buffalo, and 600 lbs. at Albany, to replace that which was put in before starting from Chicago. (That is three icings altogether, one at starting, and two by the way, for 1,005 miles.) Several cars safely took their loads of beef from Chicago to New York, using only 1,800 lbs. of ice in the trip. It may be said that the average cost of icing will range from 5 to 78 per car at each icing station.

14. Say how trains with chilled meat are run, the distances they run, their average speed, and the average cost per mile per ton, or per body, for carrying and for keeping cool?—It is the custom with railroad companies carrying meats from Chicago to make up special trains carrying fresh meats and other perishable freight to the seaboard. Each day such a train consisting of twenty or thirty cars is made up, to which are added those containing butter, cheese, and fruit, all in refrigerator cars. Such trains run at the rate of twenty-five or thirty miles per hour, including stoppages. Trains not infrequently make the run from Chicago to Buffalo, 523 miles, in thirty-six hours, including one stop at Cleveland, when it is found necessary to ice there. As Buffalo is a common point at which eastward bound trains meet on their way from the west to New York and Boston, all refrigerator cars are examined there, and iced if re-icing appears to be required. The tariff rate on dressed beef is 65 cents per 100 lb. (£3 10s. 8d. per ton) from Chicago to New York. To this charge is to be added the cost of icing as given above. In answering the above questions I have been largely guided by the conditions of the trade of Chicago, because this city has done by far the greater part of the dressed meat business of this country. In the year 1884 shipments of dressed beef from Chicago amounted to 694,026 carcasses, and they have since that time increased. Perishable property is, it may be added here, carried to the Atlantic seaboard (making a journey altogether of 2,000 miles) in refrigerator cars named, from points 1,000 miles or more west and south-west from Chicago, at which points the temperature ranges from 90° to 100° Fahr., in the shade, during the heated months. In trips through such heated districts new supplies of ice are put into the tanks in the cars three times in each 1,000 miles.

15. Whether the meat ever arrives in bad condition? If it does, what is the cause and the percentage of loss from this cause?—In the earlier days of this business, when people were experimenting for the purpose of overcoming the obstacles then met, some cargoes reached their destinations in bad order, the cause having been imperfect insulation, and the ignorance of employés; but it is now held that there is little, if any, risk of loss in shipping fresh meats or other perishable property. The percentage of loss of goods in refrigerator cars is too small to be estimated.

16. What are the form and construction of the meat markets, and of the cold store attached; the rate of market dues, and the charges per day for keeping meats in the chill-rooms?—As the markets are largely owned or rented by private parties who make leases, when they do lease, upon private terms, no answer that would have value in another country, or in other conditions, can be made. In a few cities stalls are rented by retailers from the municipal authorities; but the rates and conditions vary greatly. In regard to the construction of the markets, it may, perhaps, be well to try to answer by describing the retail market

of one Chicago firm, which ships large quantities of fresh beef to the eastern States, to Europe, and to many interior points in this country. In the market referred to a counter extends the entire length of the room, the walls of which are frequently covered by a coating of whitewash, and the floor thickly carpeted each day with fresh clean fine pine sawdust. Through the middle of the room is a row of square pine posts supporting the floor above. These posts are also whitewashed, and each has attached to it brackets which support bunches of fresh flowers during the season when the flowers bloom in the open air here. The top of the counter on which the meat is served to customers is of marble, smoothly polished. Behind the counter are rows of strong hooks, upon which are suspended a few—and only a few—pieces of meat in a fresh state, most of the meats thereon being cured hams, or bacon, or sausage. On the heavy cutting blocks under the rows of hooks the butchers cut such pieces as the buyers require. Immediately after the wants of the buyer are satisfied the quarter of beef from which the cuts have been taken is returned to the cool room from which it was brought. It remains there until another piece is wanted for another buyer. Scales are suspended behind the counter for weighing the meats as they are served to the buyers. The chill-room or cold store, in which the meat is kept while awaiting the coming of the buyers, has walls insulated by dead air-spaces, or by other devices, or is kept cool by ice stored in proper receptacles so arranged that while the chilled air falls in the room below, the moisture thereupon passes away without coming into contact with the meats. Great care is used in all cold store arrangements to prevent the cold air bearing moisture to the goods to be preserved, and so perfect are some of the cooling devices in use that not the slightest trace of moisture can be seen in the apartment where the goods are stored. In this room the ice is placed in a receptacle at one side. From the ice the cold air falls into a store-room below, where it becomes slightly warmed by passing over the meats or other food placed there. The warm air rises through the open floor of the second chill-room, and thence through openings near the ceiling into the room where the ice is stored to again make the round as before. Arrangements are made so that valves close the opening near the ceiling the instant the door of either of the cold storage rooms is opened. The closing of the valves stops the current of warm air, which would but for this fall upon the ice, and cause it to waste rapidly away. When the door is again closed the valve is opened, and the circulation of air goes on as before.

17. Describe the receiving of meat intended for sale in the market; the mode of selling and delivery?—Upon arrival of the train conveying fresh meat, say in New York, the cars are run into a storage establishment. The meat is carried into the cold storage room, and remains there in a temperature of about 36 deg. to 42 deg. Fahr. until wanted. As a rule the quarters are sold to retailers, who come at an early hour in the morning, or who send in their orders in the afternoon of one day for the meats they want for the next morning. Waggoners prepared for the purpose go about in the morning delivering the meats ordered by the retailers. In some cases hotel managers and others using large quantities of meat order one or two car loads at a time, and keep the meat in cold storage rooms until required for their daily business. Poultry and game are also kept in this way.

18. What proportion does the dead meat now stand to the fat stock trade? Is the dead-meat trade increasing and likely to increase?—This question is in part answered by the reply to query No. 3. The traffic in fresh meats grew rapidly, but not steadily, almost from its inception. It must continue to increase unless there shall be a revolution in trade affairs, and in the desire of the people to obtain the best meats for the smallest outlay. During the last five years the growth of the trade in dressed beef has been as follows:—From 1881 to 1882 the increase was 42·5 per cent. over the trade of 1880; in 1882 the gain was 50·3 per cent. over the traffic of 1881; in 1883 it was 127·5 per cent.; in 1884 it was only 23·6 per cent.; and in 1885 it was 25·2 per cent. The relation borne by the entire dressed beef trade of Chicago to the fat stock traffic of that city may be seen by a glance at the figures given in the second table sent herewith.

19. What distances are live stock carried by rail, and are they taken out and fed on the journey; if so, how often?—Cattle have been sent by rail from Oregon on the Pacific Coast to New York on the Atlantic seaboard. It is a law that cattle shall not be kept confined in cattle cars for a period longer than twenty-four hours without being unloaded for food, water, and rest. In the region west of Chicago trains do not, as a rule, run at as high a rate of speed as trains maintain on railways east of Chicago. Such trains now run from 250 to 500 miles without stopping for feeding and resting the stock.

20. What is the average cost of carrying a fat bullock per mile for 100 miles and upwards?—From Kansas City to Chicago the distance is 500 miles, and the rate is 65 dollars (that is, at 4s. 1d. for the dollar, £13 5s. 5d. for the truck for 500 miles, or, say, 16s. 8d. per head) per car load for cattle, nominally 20,000 lb., but really often nearly or quite 24,000 lb. From Chicago to New York the rate charged is £22 per truck for 1,005 miles, or £1 8s. per head. The average number of cattle in a car load is sixteen, the range being from twelve fat heavy cattle to twenty thin and small ones.

Very respectfully,

NORMAN J. COLMAN,
Commissioner of Agriculture.

Washington, D.C., 19 July 1886.

MEAT MARKET AT DARLING HARBOUR.

PROGRESS REPORT of the Board appointed to inquire into and report upon the various matters necessary to render the building now being erected at Darling Harbour suitable for a Meat Market.

After prolonged consideration of the various possible methods of bringing the meat to and receiving and hanging it in the market, and its subsequent delivery therefrom into butchers' vans, or the placing of the unsold remainder in chill-rooms, we have arrived at the conclusions hereinafter explained.

Specially designed trucks will be required for the conveyance of the chilled or unchilled meat by rail. They should be built to accommodate carcasses of an average size, and be of a uniform pattern; the carcasses to be hung on wheeled hooks running on iron bars supported from the roofs of the trucks, in order to facilitate unloading, as will be explained afterwards; and provision should be made for hanging the carcasses in the trucks so that the air may circulate freely round them, and they should be kept clear of the floor.

The vans for conveying meat a journey of a few hours only during the night can, if necessary, be constructed on the frames of many of the present cattle-trucks; but the present bodies of these could not, it is feared, be made use of. In constructing new vans, precautions will have to be taken for the exclusion of heat, dust, and rain, but no special provision for producing cold air will be necessary for short distances. We have been unable to arrive at a satisfactory method of conveying meat over the long distances that will have to be accomplished if the full benefits hoped for from the contemplated change in the meat trade are to be reaped in the discontinuance of conveying live stock by rail and its accompanying disadvantages. The successful accomplishment of this object in the hottest weather is vital to the whole question. No cars have yet been introduced or constructed in the colonies that will meet this requirement. The matter is one of special importance, not only from a trade point of view, but also on account of the large expenditure that would have to be incurred to build suitable trucks and devise a means of keeping the meat cool. We understand that Messrs. Armour and Company, of Chicago, have a system by which chilled meat can be carried a distance of over 1,000 miles by rail without depreciation; and we consider it very desirable that information respecting their system should be obtained, in order to see whether it can be adapted to the circumstances in this colony. We are aware that the natural supply of ice of a very low temperature enables the process to be carried out in the United States in a more economical manner than could be done here with artificial ice of a higher temperature, but this difficulty will probably be capable of being minimised in some way; and, as the question of carrying chilled meat long distances is, as has been pointed out, a most important one, a practical solution of it would well repay the cost of thoroughly investigating it by some one acquainted with our special requirements.

Frozen meat can be readily brought in insulated trucks from the most remote districts, but it could not compete with chilled or fresh meat in the market, and it would also entail the erection of large thawing-rooms and their accessories.

The system that affords the greatest advantages in the placing of the meat in the market is the arrangement of Placing of the overhead bars, suspended from the main columns of the building, upon which the wheeled hooks carrying the meat meat in the can be rapidly moved, and made to run in any desired direction by quadrant connecting bars. By this system the market meat can be quickly received from the trucks, and distributed to the various parts of the building, and arranged in a systematic manner so as to admit of its rapid inspection and comparison by purchasers. This system can be adopted whether the trucks are brought under the building and raised by hydraulic lifts or alongside the street front. The latter method would enable six trucks to be discharged simultaneously, and would save the cost of and space occupied in the basement by the lifts, turn-tables, and sidings.

The building having been originally designed as an adjunct to a large chill-room at Glebe Island, is not suitable for the continuous sale of meat throughout the day, as no provision has been made for excluding the heat, the building being entirely open on all sides, and every possible means of providing ventilation and light have been adopted. The meat, however, will be sold early in the morning, and this has been kept in view in considering the matter. It appears to us that this arrangement not only suits the character of the building and the incidences of railway traffic, but may also have the effect of bringing into existence a class of small chill-rooms in the town that are greatly required to prevent the constant loss of meat during the hot weather, a butcher's shop in this climate being incomplete without a chill-room.

The chill-room accommodation that will be required for meat remaining unsold during a glut in the market has been carefully considered; but we are of opinion that, until the trade has assumed a definite shape, it will not be advisable to erect permanent chill-rooms, which are not only always costly works, but are of a nature which prevent subsequent alterations except at great expense. We consider that temporary chill-rooms, with portable machinery, should be erected at the southern end of the market, adjoining to and level with the present floor, into which unsold meat could be readily placed. The temporary chill-rooms should be capable of holding about 20 tons of meat, and the engine should be

Reception of the meat in railway trucks.

Chill-room accommodation.

capable of producing sufficient cold air to reduce that quantity of meat to a temperature of 40° Fahr. in twenty hours. The engine power should be provided by two machines, so as to avoid stoppage in case of one breaking down, and so that the power may be varied according to the quantity of meat to be chilled. This will, we think, meet all temporary requirements.

No recommendation can be made as to the use to be made of the basement of the building until it has been decided whether the meat is to be brought into the market from the basement or from a siding in the street. It seems to us that it would not be advisable to lease it to persons desirous of having private chill-rooms, not only because more eligible sites can be found elsewhere, but also because the distribution of air over large areas and through independent establishments is very uneconomical. Chill-rooms for saving meat that would otherwise be lost in hot weather in the retail shops should form a part of such shop, or at least should have close connexion with it. Chill-rooms in connexion with the market should deal in a wholesale manner only, and they would prove more convenient if on a level with it, the engine-power being placed below. We consider that it would be better to convert the basement into a market for dairy produce, to which it could be admirably adapted by fitting it up with small cool-rooms, stalls, &c., and lighting it by electricity. A convenient approach, although not the best that could be wished, can be made by grading Allen-street into Pyrmont-street, and sweeping in a curve may encroach for 2 chains on the ground recently excavated. Access could also be had from Pyrmont Bridge road. The importation of dead meat from other colonies is a business which is sure to follow the closing of the abattoirs and the prevention of killing in the neighborhood of Sydney. During the late scarcity, viz., since June last year, 16,000 head of cattle have arrived in Sydney by sea from Queensland and our own northern ports. These were chiefly killed for the Sydney trade. When the time comes for designing permanent chill-rooms for the market this subject should be kept in view, and future enlargements and access to the wharves should be arranged for. In plentiful seasons the same rooms could be used for the export trade which must in future be done through the railway accommodation of the colony.

The working expenses of the market will probably be something like £4,500 per annum, irrespective of interest on capital. Taking half the cost of the basement, the whole cost of the superstructure, and the probable cost of fittings, chill-rooms, &c., say, at the round sum of £60,000, the interest at 5 per cent. would amount to £3,000 per annum, making the total annual cost £7,500. The average quantity of meat killed at the Glebe Island Abattoir is about 33,000 tons per annum, the value of which is about £337,000—about £25 per ton. A uniform charge of 3d. per cwt. or 5s. per ton on this quantity would give £8,250 per annum, which would cover the working expenses and interest on capital and leave a margin for a sinking or depreciating fund, but nothing less than 30,000 tons a year at that rate would cover working expenses and interest on the outlay. This charge would cover all labour necessary for handling the meat until it reached the butchers' vans. The charge could be reduced if the market is used to its full capacity, but it is probable that some time would elapse before it would cover the expenses.

Judging from the experience gained during chilling operations lately carried on at Glebe Island the cost of handling and chilling meat in quantities of about 80 tons per day is about 1½ per cent. of its average value (£25 per ton), or about 7s. 6d. per ton. The quantity of meat remaining unsold or left in the market after the sales will fluctuate, and it is expected that it will seldom exceed 20 tons, while it may average only 8 or 10 tons per day. Should it at any time exceed 20 tons, there are several private chilling-rooms in the city to which the balance could be removed. It is therefore difficult to estimate a charge that will cover the expense of chilling. In Melbourne, where some firms combine this business with other freezing business, a charge of 2s. 6d. per cwt., and a farthing per pound for quantities exceeding that weight, is found to be remunerative to both parties. The charge in Sydney is one halfpenny per pound, which is almost prohibitive, butchers often preferring to send their meat to preserving or boiling-down establishments. A high charge also causes greater risks to be run, and the consequent loss of meat. We are of opinion that if an average quantity of 8 or 10 tons is treated daily, the cost of chilling would be more than covered by a general charge of a shilling per cwt. per forty-eight hours, and we are inclined to think that this would be the best charge. The matter will be further considered in the final Report.

Our recommendations with regard to the building are briefly as follows:—

- (1.) Temporary chill-rooms of about 20 tons capacity should be erected at level of decking near the southern front of the building; permanent rooms should only be built after the practical working of the trade has displayed their necessary size and specialities. The refrigerating machinery at present erected at Glebe Island can be conveniently utilized if large import and export chilling-rooms are erected, but it is too large for the small chill-rooms herein recommended.
- (2.) We cannot advise the leasing of the basement as sites for private chill-rooms, as we consider it would be preferable to convert it into a market for dairy produce.
- (3.) The Sydney Municipal Council has refused to sanction the laying of a siding in Pyrmont-street; but this method of approach offers so many advantages that all possible steps should be taken to obtain the required permission.
- (4.) The Allen-street approach to the basement can be made practicable by sweeping a curve for about 2 chains over Government land.

Draft regulations and complete working plans can only be framed after the questions remaining unsettled have been decided. The accompanying plans are merely preliminary sketches, sufficient to show the utility of the various methods.

GEORGE COWDERY.
DAVID KIRKCALDIE.
ARTHUR G. KENWAY.

The Commissioner for Railways.

20/8/85.

APPENDIX B.

EXTRACTS FROM A PAMPHLET ON "THE MEAT TRADE, ITS DEFECTS AND REMEDY," PUBLISHED BY W. MADDOCK, 383 GEORGE-STREET, SYDNEY.

TREATMENT OF FAT STOCK AT PRESENT ON THE WAY FROM THE PASTURES TO THE ABATTOIRS.

"That deterioration in the meat is going on, any one at all acquainted with the trade is well aware; but, for the sake of those who are not, we will run over some of the more serious hardships to which fat stock are now subjected on the way from their pastures to the abattoirs:—They are driven on foot, perhaps, 300, 400, or even 500 miles to market, or they may be partly driven and partly trucked; and, however carefully they may be taken, these long distances must have a deteriorating effect on the meat, for the mere travelling must, supposing they had sufficient food, waste the juices, and to a large extent destroy its appearance and flavour. Then, again, it is only in the far interior that fat stock on the way to market get anything like sufficient food. Within 300 miles of Sydney the feed is short and scarce, and as the stock come nearer they have at times to be rushed through narrow lanes, hurried along over rough mountainous country, where the grass is scarce and rough; their feet are often cut and bruised on the rocks and stones, and on the metalled roads; they are frightened and irritated by meeting and passing coaches, teams, and footmen; and if they are trucked, they are knocked about in trucking, always roused and fevered, often hurt and bruised, and sometimes knocked down and trampled upon in the trucks. On reaching the sale-yards, they are starved there for a day, at least, and frequently for three or four days, and sometimes even a whole week afterwards, in the miserable waiting paddocks near Sydney, as they seldom or never go direct from the yards to the abattoirs—the butchers, as a rule, not "killing out," but keeping a supply on hand. In this way, by the time the stock are slaughtered, the appearance and quality of the meat, through wasting, starvation, ill-usage, fever, and bruising, are so much deteriorated as to make even the very best and least wasted wanting in colour and flavour, the best of it only middling as compared with English meat, and the greater part of it usually inferior, and, therefore, largely unfit for consumption in the colony, and most unfit for exportation."

To establish a satisfactory dead-meat trade it would be necessary—

- (1.) To kill the stock at the main centres of the stock traffic on the railway, as near the pastures on which they are fattened as possible; or, if they have travelled any distance, where they can get plenty of good grass and water, for eight, ten, or even more days, till they are well rested and cooled down, and thoroughly free from fever.
- (2.) To send the meat, after it has hung for a few hours on the "baulks," without handling, to a chilling house, where it can remain for at least 24 hours at a temperature of, say 40°, until it is chilled and set cold to the bone, which it can be at a cost of less than 1-40th of a penny per lb., or about 1s. 8d. per body of beef.
- (3.) To put it, late in the day, into non-conducting meat trucks (ice will very seldom be required) and send it by train, at a speed of at least 20 miles an hour, to Sydney; and,
- (4.) To run the trucks, on its reaching Sydney, into a proper store provided with the necessary appliances for cooling and keeping the meat; and there either dispose of it to the retail butchers in Sydney or prepare it for exportation as frozen, chilled, tinned, or salted meat.

The advantages of a dead-meat trade:—

- (1.) The great suffering and terrible starvation to which our fat stock are now subjected would now cease.
- (2.) The risk and inconvenience from which the people in the suburbs now suffer through the driving of the stock would be at an end.
- (3.) There would then be very little slaughtering at the abattoirs.
- (4.) The appearance and quality, as well as the flavour and nutriment, of the meat will be thoroughly preserved; and, after it is delivered in Sydney, it will keep from 36 to 48 hours longer than abattoir-killed meat now will.
- (5.) The conveyance of the fat stock to market in the carcass will cost their owner considerably less than sending them alive, for a great deal of space is, so to speak, wasted in a truck in which live cattle are conveyed; and at least eleven or twelve bodies of cooled, well-set beef and their loose fat could be put into the same space as eight or nine live cattle, while the charge for the truck would in each case cost the same, or, rather, the meat ought to cost considerably less, as the truck in which it is carried can be loaded back with general merchandise, which the live-stock truck cannot be.
- (6.) The making the trade a dead-meat one would prevent the spread of contagious and infectious diseases among stock, as it would do away with the necessity for bringing large numbers of stock (as the live trade does) together, and on the same ground; and thus save our stock owners from the recurrence of the heavy losses they now sustain from the diseases which are spread by fat stock going to market, and, at the same time, give the consumer cheaper and healthier meat.
- (7.) It would break up monopoly which now exists in the meat trade, for the producer would not then be compelled, as he now is, to sell to the middleman; but could send his meat direct into an open, well-regulated, public, daily market, which would be within the easy reach of the retail butchers as a class; while they, again, would be able to get an ample supply of prime, well-set, chilled meat, day by day, as they require it; the producer and consumer would be brought closer together, and the carcass butcher would be no longer able to control the retail butcher.

APPENDIX C₁.

"Bontharambo," Wangaratta,
8th October, 1888.

To the Secretary, Royal Sanitary Commission, Melbourne.

SIR,

Yours of the 1st instant to hand. I am not likely to be in town until early in December, when I shall be happy to give evidence, if required. In my opinion, it would be highly advantageous to both producers and consumers that stock should be slaughtered in the country, near the pasture grounds; but the feasibility or otherwise of carrying out such a scheme will rest mainly with the Railway Department. Unless cold-air cars are run, and a cold dépôt for the meat is established in Melbourne, it will be impossible to slaughter in the country during the summer months.

Yours faithfully,

FRED. GEO. DOCKER.

APPENDIX D₁.

ABSTRACT OF A LETTER TO THE COMMISSION FROM WILLIAM HENRY PALMER, GRAZIER, CHARLECOTE, SALE.

He concurs in Mr. Reynolds' evidence that up-country killing would be an advantage. If carried on to any extent, cold storage would soon be provided in which meat could be kept. Cattle begin to deteriorate 24 hours after leaving their pasture. They get fevered by their treatment in trucking, in the train, and in the yards, and, in consequence, the meat loses its juice and fine flavour. Chilling meat has a most beneficial effect on its keeping qualities, the effect lasting even after being taken from the chill-room. Unless great facilities are given for the conveyance of meat by the Railway Department, and the freights made more

reasonable, slaughtering up-country cannot be carried on with advantage. At present, the country killer is heavily handicapped. The freight for dead meat is very high, the labour of loading and unloading has to be paid for by the owners, and also the carting from the railway station to the meat market; and there is the additional cost of sending the skins to Melbourne.

Some time back, he wrote to the Railway Commissioners on the subject of the freights, and was informed that they considered the present charges reasonable.

The failure to make country slaughtering pay in the past has been due to the above disadvantages. Let proper facilities be afforded for the conveyance of meat, and slaughtering up-country, would soon become general, as it is in America; and then there would be no occasion to close the yards at Kensington—so few stock would be sent there, it would not be worth while keeping them open. He disapproves of the proposal to remove the yards and abattoirs to Seymour, Echuca, or some other country town. How could graziers from the west or from Gippsland get their stock there?

APPENDIX E.

EXTRACT FROM A LETTER FROM MR. W. G. LOCK, MANAGER OF THE NEW SOUTH WALES FRESH FOOD AND ICE COMPANY LIMITED, SYDNEY, HAVING REFERENCE TO THE RATES FOR CHILLING MEAT.

Please find enclosed the rates for chilling meat now adopted by all the refrigerating companies here. Mr. Richards is quite right in his evidence, that $\frac{1}{2}$ d. per lb. is charged for chilling meat, but that rate included the cost of keeping it in the cold room for a fortnight, if necessary; $\frac{1}{4}$ d. per lb. is charged for freezing meat in very large quantities, but this rate is a very low one. None of the New Zealand companies freeze for less than $\frac{3}{4}$ d. per lb. We think Mr. Playfair is wrong in saying the charges for chilling were one half-farthing ($\frac{1}{8}$ d.). We remember no instance in which less than $\frac{1}{4}$ d. was charged.

REFRIGERATING CHILLING.

CHARGES AT THE REFRIGERATING COMPANIES IN SYDNEY:—

| Quarters of Beef. | | | | | | | | s. | d. |
|---|-----|-----|-----|-----|-----|-----|-----|----|-------------|
| For 24 hours | ... | ... | ... | ... | ... | ... | ... | 2 | 6 each. |
| Over 24 hours and not exceeding 3 days | ... | ... | ... | ... | ... | ... | ... | 3 | 0 " |
| " 3 days and not exceeding 6 days | ... | ... | ... | ... | ... | ... | ... | 4 | 0 " |
| Sheep, Lambs, Calves, and Pigs. | | | | | | | | | |
| Over 60 lbs., five or more, for 24 hours only | ... | ... | ... | ... | ... | ... | ... | 0 | 8 each. |
| " " over 24 hours and under 3 days | ... | ... | ... | ... | ... | ... | ... | 0 | 9 " |
| " " over 3 days and under 6 days | ... | ... | ... | ... | ... | ... | ... | 1 | 0 " |
| Over 60 lbs. but under 120 lbs., three or more, for 24 hours | ... | ... | ... | ... | ... | ... | ... | 0 | 10 " |
| " " " over 24 hours and under 3 days | ... | ... | ... | ... | ... | ... | ... | 1 | 0 " |
| " " " over 3 days and under 6 days | ... | ... | ... | ... | ... | ... | ... | 1 | 3 " |
| Over 120 lbs. but under 180 lbs., two or more, for 24 hours | ... | ... | ... | ... | ... | ... | ... | 1 | 4 " |
| " " " over 24 hours and under 3 days | ... | ... | ... | ... | ... | ... | ... | 1 | 6 " |
| " " " over 3 days and under 6 days | ... | ... | ... | ... | ... | ... | ... | 2 | 0 " |
| For single carcasses, less than five of 60 lbs. and under 3 days | ... | ... | ... | ... | ... | ... | ... | 1 | 0 per cres. |
| " less than five of 60 lbs., over 3 days and less than 6 days | ... | ... | ... | ... | ... | ... | ... | 1 | 6 " |
| " three of 60 lbs. and less than 120 lbs., 3 days | ... | ... | ... | ... | ... | ... | ... | 1 | 4 " |
| " three of 60 lbs. and less than 120 lbs., over 3 days | ... | ... | ... | ... | ... | ... | ... | 1 | 8 " |
| " two of 120 lbs. and less than 180 lbs., 3 days | ... | ... | ... | ... | ... | ... | ... | 2 | 0 " |
| " two of 120 lbs. and less than 180 lbs., over three and less than six days | ... | ... | ... | ... | ... | ... | ... | 2 | 6 " |

Over 180 lbs., as per quarters of beef—
All joints, beef, mutton, &c., at $\frac{3}{4}$ d. per lb. per week.

APPENDIX F.

RETURN OF SHEEP AND CATTLE ARRIVING DEAD OR INJURED IN TRUCKS FOR THE LAST TWELVE MONTHS ON VICTORIAN RAILWAYS, NOVEMBER 1st, 1888.

| Receiving Station. | | | | | Killed or Injured. | |
|--------------------|-----|-----|-----|-----|--------------------|---------|
| | | | | | Sheep. | Cattle. |
| Newmarket | ... | ... | ... | ... | 730 | 142 |
| Ballarat | ... | ... | ... | ... | 50 | 18 |
| Sandhurst | ... | ... | ... | ... | 280 | 5 |
| Geelong | ... | ... | ... | ... | ... | 2 |
| Benalla | ... | ... | ... | ... | ... | 302 |

Total number carried, 135,000 cattle; 1,400,000 sheep.

APPENDIX G_I.

EXTRACT FROM REPORT BY DR. BALLARD ON EFFLUVIUM NUISANCES.

SIXTH ANNUAL REPORT LOCAL GOVERNMENT BOARD, p. 147.

“The nuisances arising from uncleanly and badly-conducted slaughtering establishments may, by their operation on the senses, produce similar functional disturbances to those which evil odours from other sources are apt to occasion, and, in so far as they are filth nuisances, they are unquestionably injurious to the health of persons exposed much to their influence. Considering the loose and unwholesome manner in which slaughtering is carried on at South Shields, I asked of Dr. Spear, the Medical Officer of Health there, and of some other medical men practising in the neighbourhood, the opinion which their experience had led them to form as to the injury inflicted thereby upon health. Dr. Spear tells me that he has arrived at a very decided opinion on the subject. He says that in his experience, during the two years he has held office, the houses where slaughtering is carried on have been chief foci of zymotic diseases, and that in tracing back outbreaks of such diseases in the town he has, on more than one occasion, traced back the infection to these houses, and has been unable to trace it back farther, and that, in common with many of the medical practitioners, he is of opinion that the course of zymotic diseases and the type assumed by them have been unfavorably influenced by exposure to the slaughter-house effluvia. There appears, moreover, to be a general impression among medical men that women living in the houses where they are exposed to these effluvia make bad recoveries after childbirth. And there is also another less direct way in which the effluvia from a badly-kept and badly-managed slaughter-house may conduce to injury to public health, namely, through the influence which the septic effluvia from them may exert upon the recently killed meat. It is a common practice in England to hang up the dressed carcasses to cool and “set” within the slaughter-house. When the slaughter-house is too warm, or charged with septic effluvia, the meat not only cools slowly and sets slowly, but is liable to imbibe septic matters from the slaughter-house atmosphere. And such slow setting of the meat and absorption of septic ferments are apt to conduce to early decomposition of the meat, especially in the warmer season of the year, or when the meat is the produce of animals which, although diseased, are not so diseased as to render the meat, in the opinion of judges of meat, unfit under favorable circumstances for human consumption. Putrid meat, meat obviously tainted, is carrion, and probably would hardly find a purchaser, but it is well known to medical men that some meat, apparently good and wholesome meat not obviously tainted, may produce when cooked and eaten very serious disturbance in the system of the consumer, symptoms of irritant poisoning.”

INDEX TO REPORT.

- Abattoirs, part III., pp. xxiv-xxxii.
 advantages of removal, p. xxix, sect. 5.
 city, pp. xxvi and xxvii, sect. 2.
 condition of, in metropolis, p. xxvi, sect. 2.
 „ individual, p. xxviii, sect. 3.
 effect of, on health, p. xxvi, sect. 2; part III., pars. 1 and 16; and p. xxviii, sect. 3.
 Metropolitan Board of Works to control, pp. xix and xxxi.
 objections to removal of, p. xxx, sect. 6.
 proposals of city council for improvement of, p. xxx, sect. 7.
 question of removal of, p. xxxiii, sect. 4.
 recommendations concerning, p. xxxi, sects. 9 and 10.
 rules for construction and management of, pp. xxv and xxv, sect. 1.
 suburban, p. xxvii, sect. 2.
 Adelaide, sanitary condition of, p. xii, part I., sect. 4.
 mistakes made in deep drainage of, p. xiii, sect. 6.
 Advantages of country killing, p. xxiii, sect. 4.
 Apathy of local boards, p. x.
 Arguments for placing abattoirs under Metropolitan Board of Works, p. xix, sect. 16.
 in favour of country killing, p. xxiii, sect. 4.
 against country killing, p. xxiii, sect. 5.
 in favour of removal of abattoirs, p. xxix, sect. 5.
 against removal of abattoirs, p. xxix, sect. 6.
 Auburn, slaughter-house and destructor, p. xxi., sect. 1.
 Board of Works, Metropolitan, pp. xv-xx and xxxi.
 abattoirs, to be controlled by, pp. xix and xxxi.
 members appointed by Government; p. xvii.
 mode of election of members of, p. xvi.
 number of members of, p. xvi.
 recommendations concerning, pp. xviii-xx.
 Boiling-down establishments, p. xxxii.
 Bone-mills, pp. xxxii and xxxvii.
 Butchers' shops, p. xxxi, sect. 3; p. xxxv, sect. 6; p. xxxvi, sect. 14.
 Candle factories, pp. xxxii and xxxiv.
 Christchurch, drainage of, p. xiv, sect. 11, part I.
 City abattoirs, condition of, pp. xxvi and xxvii, sect. 2, part III.
 removal of, p. xxviii.
 Classification of noxious trades, pp. xxxiv and xxxv, sect. 3 part IV.
 Compensation for removal of noxious trades, p. xxxv, sect. 10, part IV.
 for removal of abattoirs, p. xxxi, sects. 9 and 10; p. xxii, sect. 11.
 Condition of Adelaide, p. xii, sect. 1, part I.
 metropolitan abattoirs, p. xxvi, sect. 2, part III.
 noxious trades, p. xxxii, sect. 1, part IV.
 Sydney, p. xiii, sect. 8, part I.
 Contamination of air, p. x.
 Cost of Sydney sewerage, p. xiv, sect. 8.
 Country killing, advantages of, p. xxiii, sect. 4, part II.
 objections to, p. xxiii, sect. 5.
 conclusions concerning, p. xxiii, sect. 6.
 Country-killed meat, p. xxi, sect. 1, part II.
 Darling Harbour meat market, p. xxi, sect. 1, part II.
 Dead-meat trade in America, p. xxii, sect. 3.
 Deep drainage of Adelaide diminishes nuisances of noxious trades, p. xiii., sect. 5.
 conclusions concerning, p. xiii, sect. 7.
 Drainage of Christchurch and Dunedin, p. xiv, sect. 11.
 of Sydney, p. xiii, sect. 8, part I.
 underground, for Melbourne, p. xv, sect. 12.
 Dunedin, drainage of, p. xiv, sect. 11.
 Effect of abattoirs on health, p. xxvi, sect. 2, part III.; pars. 1 and 16; and p. xxviii, sect. 3.
 noxious trades on health, p. xxxiii, sect. 2.
 Engineer to prepare scheme for drainage of Melbourne, p. xv, sect. 12.
 Expressions of thanks, p. xiv, sect. 2, part I.
 Farm at Botany, p. xiv, sect. 9.
 Fellmongeries, p. xxxiii, sect. 1, part IV.
 Further inquiries, p. xxxviii.
 General sanitary condition of Melbourne, part I, p. viii.
 Gut factories, p. xxxiii, sect. 1, part IV.
 Hide, skin, and tallow stores, p. xxxiii, sect. 1, part IV.
 Interim recommendations for sanitary improvement of Melbourne, p. xx, sect. 18.
 Liquid refuse, p. viii, sect. 2, part I.
 Manure works, p. xxxii, sect. 1, part IV.
 Marine stores, p. xxxiii, sect. 1, part IV.
 Meat supply, part II, p. xxi.
 Meat supply, recommendations concerning, p. xxiv, part II.
 sources of, in Sydney, p. xxi.
 Metropolitan Board of Works: pp. xv-xx, sects. 13-17.
 abattoirs to be controlled by, pp. xix, xxvi, and xxxi.
 members appointed by Governor in Council, p. xvii.
 mode of election, p. xvi.
 number of members of, p. xvi.
 recommendations concerning, pp. xviii-xx.
 Mortality, returns of Metropolitan district, p. x, sect. 3.
 Mitigation of offence of noxious trades, p. xxxvi, sect. 14.
 Night-soil depôts, p. x, sect. 2, part I.
 Noxious trades, part IV., p. xxxii.
 classification of, p. xxxiv, sect. 3.
 compensation for removal of, p. xxxv, sect. 10.
 condition of, p. xxxii, sect. 1.
 conclusions concerning, p. xxxv, sect. 7.
 effect of, on health, p. xxxiii, sect. 2.
 sites for, p. xxxv, sect. 11.
 Orange and Goulburn trade in meat, p. xxi, sect. 1, part II.
 Pan closets, p. x, sect. 2, part I.
 Piggeries, p. xxxiii, sect. 1, part IV.
 Pollution of river, pp. viii, ix, and xxxvi, sects. 12 and 13.
 subsoil, p. ix, sect. 2, part I.
 Proceedings of the Commission, p. vii.
 Proposals of City Council for improvement of abattoirs, p. xxx, sect. 7, part III.
 Question of removal of abattoirs, pp. xxviii-xxx, sects. 4-6.
 Recommendations concerning abattoirs, pp. xxxi, sects. 9 and 10, part III.
 meat supply, p. xxi, sect. 1, part II.
 Metropolitan Board of Works, p. xviii, sects. 15-17, part I.
 noxious trades, p. xxxvii, sect. 15.
 sanitary improvement of Melbourne, p. xiv, sect. 12.
 interim sanitary improvement of Melbourne, p. xx, sect. 18.
 Removal of abattoirs, p. xxviii, sect. 4.
 advantages of, p. xxiv, sect. 5.
 objections to, p. xxx, sect. 6.
 conclusions concerning, p. xxxi, sect. 8.
 noxious trades, p. xxxv, sects. 8 and 9; p. xxxvi, sect. 15.
 Results claimed for deep drainage of Adelaide, p. xii, sect. 5.
 River pollution, p. viii, sect. 2, part I.; p. xxxvi, sects. 12 and 13.
 Riverstone Meat Co., p. xxi, sect. 1, part II.
 Rules for construction and management of abattoirs, pp. xxiv and xxv, sect. 1, part III.
 Sanitary condition of Adelaide, p. xii, sect. 4, part I.
 Melbourne, p. xiii, sect. 1, part I.
 Sydney, p. xiii, sect. 8, part I.
 Sewerage of Sydney, p. xiii, sect. 8, part I.
 cost of, p. xiv, sect. 8, part I.
 Sites for noxious trades, p. xxxv, sect. 11, part IV.
 Soap and candle factories, p. xxxii, sect. 1, part IV.
 Source of Sydney meat supply, p. xxi, sect. 1, part II.
 Suburban abattoirs, condition of, p. xxvii, sect. 2, part III.
 recommendations concerning, p. xxxii, sect. 11.
 Subsoil, pollution of, p. ix, sect. 2, part I.
 Surface conservancy, p. x, sect. 2, part I.
 Sydney, condition of, p. xiii, sect. 8, part I.
 meat supply of, p. xxi, sect. 1, part II.
 Water Sewerage Board of, p. xvii, sect. 14.
 Tanneries, p. xxxiii, sect. 1, part IV.; p. xxxiv, sect. 5; p. xxxvi, sect. 12.
 Thanks, expressions of, p. xiv, sect. 10, part I.
 Tips in the metropolis, p. x, sect. 2, part I.
 Treatment of refuse matter, p. x, sect. 2, part I.
 Underground drainage for Melbourne, p. xv, sect. 12, part I.
 Water supply, p. xxxvii, part V.
 recommendations concerning, p. xxxviii.
 Woolscouring establishments, p. xxxiii, sect. 1, part IV.

INDEX TO EVIDENCE.

Abattoirs (city), advantages of removing, Urie, 261.
 advantages of site at Dousta Galla, Fitzgibbon, 4578, 4580.
 accommodation-paddocks at, Urie, 252; Cattanaeh, 490, 497; Fitzgibbon, 4616, 4619, 4639; Bennet, 3949-53.
 accommodation and ventilation of, Taylor, 2012, 1983.
 accommodation yards at, Robertson, 801-816.
 a nuisance, Bowser, 3191; Urie, 255; Cattanaeh, 421.
 atmosphere at, Dickinson, 626; Bowser, 3201, 3207; Bennet, T. K., 3993; Reynolds, 3886.
 available sites for, Dickinson, 633; Speight, 6239.
 buildings too small, Cattanaeh, 428; Pritchard, 4975.
 unsuitable, Taylor, 1983-84-86; Bowser, 3208; Woolcock, 4110.
 burial of blood and offal at, Cattanaeh, 419, 426; Taylor, 1995; Jamieson, 5780; Bennet, 3977; Reynolds, 3878; Robertson, 817; Gee, 693.
 burial paddocks at, Robertson, 752-8, 832-836.
 burying of offal at, Urie, 252.
 ground, complaints about, Robertson, 847.
 cattle in mud in paddocks at, Urie, 252-255; Robertson, 806; Woolcock, 4107; Pritchard, 4986; Taylor, 1958.
 not fed at, Cattanaeh, 499-501.
 cleansing of, Gee, 685-688; Robertson, 732; Fitzgibbon, 4679.
 cleanliness of, Bennet, 3965-71, 3975; Taylor, 1979, 1981.
 complaints against, four years ago, Urie, 261.
 of smell from, Robertson, 847.
 contracts for flooring at, Robertson, 775.
 control and inspection of, Urie, 367, 388.
 construction of, Dickinson, 556.
 corporation's duty to remove refuse from, Taylor, 2018.
 cost of improvements at, Fitzgibbon, 4647.
 council of Kensington does not wish to have abattoirs improved, Cattanaeh, 530, 535.
 city of Melbourne desire to improve, Benjamin, 4560.
 covering of meat in transit from, Taylor, 2050, 2054; Elmslie, 2090, 2093; Jamieson, 5822-29.
 depreciate value of property, Urie, 261.
 desiccators at, Urie, 352, 355; Fitzgibbon, 4590; Kitchen, 6428.
 difficulty about sites for, Urie, 397.
 drains at, Taylor, 1954.
 from, Dickinson, 581, 585.
 drainage of, Urie, 263; Dickinson, 556, 580; Cattanaeh, 418; Taylor, 1970, 1978; Jamieson, 5776-79; Bennet, 3954.
 duties at, Robertson, 731, 784.
 dwellings nearest to, Urie, 319; Robertson, 846.
 effect of removal of, Waddell, 945-947.
 effects on health of noxious trades and, Dickinson, 596-600; Bowser, 3202, 3236-40; Jamieson, 5798, 5802.
 of burying of offal at, Dickinson, 559, 589, 627.
 exhalation from burial paddock at, Bowser, 3205.
 filling in of paddock at, Mountain, 5174-5182.
 floors at, Woolcock, 4114.
 flooring contracts at, Robertson, 775.
 Government inspector at, Robertson, 796.
 height of floor above low-water level, Mountain, 5192.
 history of, Fitzgibbon, 4576.
 improvements proposed by city council at, Fitzgibbon, 4582-91, 4640-63; Mountain, 5145-97.
 improvements at, Taylor, 1954.
 influence on State school children of yards and, Elmslie, 2070, 2090.
 inspection at, Gee, 677, 684; Robertson, 791; Taylor, 2046, 2049; Jamieson, 5809, 5822, 5830; Pritchard, 5013-15-20; Reynolds, 3889, 3895.
 instruction as to duties at, Gee, 636, 642.
 keeping of cattle at, Gee, 638, 670.
 management and cleansing of, Fitzgibbon, 4679.
 might be improved, Howat, 4464.
 must be near city, Reynolds, 3924.
 no alteration of level where buildings are, Mountain, 5156, 5159.
 number of stock slaughtered at, Gee, 645, 650.
 nuisance from, might be removed, Bowser, 3216, 3224.
 objected to, even if improved, Urie, 352, 556.

Abattoirs (city), *continued*—
 objections to, Cattanaeh, 418.
 removal of, Fitzgibbon, 4783; Trenchard, 4203; King, 4520.
 one central, Fitzgibbon, 4672, 4735-56.
 polluting river, Urie, 252; Cattanaeh, 418.
 possibility of preventing offence on present site of, Taylor, 2009, 2016, 2034, 2036.
 present condition of, Bowser, 3191, 3236, 3240.
 site could be made good, Reynolds, 3935.
 proper drainage of, impossible, Urie, 263.
 proposed improvement at, Mountain, 5147, 5173; Fitzgibbon, 4582, 4591.
 protest by council of Kensington against retention of, Urie, 252.
 rail to, Robertson, 864.
 reasons for removal of, Urie, 252; Cattanaeh, 411-428, 486-488, 490-497.
 against removal of, Fitzgibbon, 4576, 4733; Trenchard, 4203; King, 4520-53.
 removal of refuse from, Taylor, 2000-2007.
 removal of, Jamieson, 5806, 5808; Bowser, 3257; Woolcock, 4157; Speight, 6237; Service, 4198; Dickenson, 632.
 revenue from, Fitzgibbon, 4692; Urie, 383.
 site suitable for, Benjamin, 4561, 4563, 4566; Jamieson, 5771, 5775; Bennet, 3946-3948.
 unsuitable, Reynolds, 3866-3874; Pritchard, 4977, 4982; Kenway, 2675, 2680; Taylor, 1955; Urie, 259.
 too low, Urie, 257, 262; Cattanaeh, 418; Taylor, 1956.
 too low and unsuitable, Woolcock, 4106-4108.
 state of road leading to, Robertson, 776-783.
 tenure of land, Fitzgibbon, 4578-4580.
 the buildings and their repair, Gee, 698.
 time taken in making improvement at, Fitzgibbon, 4663.
 cattle remain in paddocks at, Cattanaeh, 540.
 cattle kept at, Taylor, 1964.
 treatment of refuse at, Gee, 693-696; Robertson, 773, 774, 817, 829.
 cattle at, Robertson, 798; Reynolds, 3934, 3935.
 blood and offal, Taylor, 1994; Jamieson, 5780-5783, 5847; Bennet, 3977-3984; Reynolds, 3878; Robertson, 817.
 utilization of site of, Dickinson, 627, 632; Cattanaeh, 514-523.
 ventilation of, Bennet, 3972.
 where they should be erected, Urie, 375, 379.
 would retain the, Bowser, 3257; Reynolds, 3924.
 would be better in Government hands, Urie, 398.
 Abattoirs (Footscray), Gomm, 6279, 6318, 6350-54, 6310-16; McCarthy, 6463; Kitchen, 6424.
 Abattoirs (Port Melbourne), abolition of the, Clark, 5474.
 condition of, Prohasky, 5413, 5420.
 difficulties in drainage of, Clark, 5437.
 drainage of, Prohasky, 5416, 5417.
 inspection of, Clark, 5469, 5472.
 main drain of, Clark, 5437.
 tenure of, Prohasky, 5421.
 revenue of, Clark, 5467.
 Abattoirs (South Melbourne), abolition of the, Smith, 4791, 4794; Miles, 4838-4860.
 condition of the, Smith, 4756.
 defective drainage of the, Smith, 4759-4771.
 previous negotiations, Smith, 4797.
 proposals of the council, Smith, 4800, 4820, 4825.
 revenue and expenditure, Miles, 4852, 4854.
 unsatisfactory, Miles, 4836.
 Abattoirs (Williamstown), condition of, Craig, 5249, 5265, 5271.
 difficulties of site, Smith, 5282.
 drainage of, Smith, 5293, 5294.
 improvements at, Craig, 5258.
 keeping of pigs at, Craig, 5268, 5270, 5261-64.
 site desired for, Smith, 5285, 5290.
 Abattoirs (Glebe Island, Sydney), Cattanaeh deodoriser at, Roser, 2817; Jager, 2746.
 cleansing of, Jager, 2744.

Abattoirs (Glebe Island, Sydney) *continued*—

- collection of blood from animals, Jager, 2767, 2775.
- desiccators at, Roser, 2781-82, 2789-92, 2814-15-16; Kenway, 2621.
- expenses and receipts for 1887, Roser, 2814, 2815.
- inspection of, Jager, 2720, 2743.
- method of inspection of meat at, Jager, 2720.
- nuisances connected with desiccator at, Roser, 2782, 2784.
- number of animals slaughtered at, Jager, 2719.
- results of the desiccator at, Roser, 2781.
- use of Cattanaich deodorant at, Jager, 2746, 2751.
- Abattoirs (Caleutta), Bowser, 3243-3256, Simpson, 5605.
- construction and site, Simpson, 5613.
- drainage of, Simpson, 5613; Bowser, 3253.
- establishment, a municipal one, Simpson, 5614, Bowser, 3245.
- refuse, Simpson, 5613, Bowser, 3255.
- Abattoirs at Munich and Berlin, Service, 4174, 4184.
- can be near a city, Service, 4198.
- private, in Adelaide, Smith, 1126, 1129.
- can be near population, Miller, 6268.
- should be elevated, Kenway, 2674-2681.
- Abolition of the Port Melbourne abattoirs, Clark, 5474.
- of the South Melbourne abattoirs, Smith, 4791, 4794; Miles, 4838, 4860.
- Accommodation-paddocks, Urie, 252; Cattanaich, 490, 497; Fitzgibbon, 4616; Robertson, 800; Bennet, 3949, 3953.
- condition of, Fitzgibbon, 4619, 4639.
- Action at Common Law to repress nuisances, Buchan, 6648, 6649.
- of C. B. of Health, Keeble, 5748, 5750, 5752; Buchan, 6649, 6654-60, 6666, 6667.
- Adelaide, a number of private abattoirs in, Smith, 1126, 1129.
- closet system wastes water, Bayer, 1582.
- amount of water required for, Bayer, 1585.
- commission appointed to inquire into sanitary condition of, Whittell, 1197.
- condition of, before completion of deep drainage, Smith, 1049-1070; Whittell, 1190-1197; Way, 1630.
- death rate of, Smith, 1070, 1072, 1075.
- difficulty in estimating population of, Whittell, 1199.
- disposal of refuse in, Smith, 1049; Whittell, 1190-1197.
- drainage of the suburbs more favorable, Way, 1683.
- health officer's report for, Smith, 1075.
- mortality rates for, Whittell, 1198-1207; Sprod, 1251; Way, 1666-1682.
- mortality high prior to deep drainage, Smith, 1069.
- no individual cases of failure of water supply, Smith, 1110.
- removal of refuse in, Smith, 1147-1156.
- sewerage rate for, Smith, 1134; Robertson, 1759; Way, 1708-09.
- slaughter-houses better out of, Sprod, 1304.
- street sweeping in, Sprod, 1332.
- surface water drains into river, Smith, 1065, 1145; Sprod, 1331; Way, 1651.
- subsoil condition of in, Smith, 1064; Whittell, 1207-1222.
- typhoid fever imported from Teetulpa and Broken Hill, Smith, 1086, 1088; Sprod, 1350.
- in, Whittell, 1207.
- very insanitary prior to deep drainage, Way, 1630.
- water supply of, Whittell, 1617.
- water supply very impure, Sprod, 1342.
- zymotic diseases imported to, Way, 1680.
- Adelaide deep drainage, cost of, Smith, 1134.
- danger to health from, without constant supervision, Whittell, 1207; Sprod, 1274-77.
- difficulty from defective plumbing, Smith, 1094-97; Sprod, 1270.
- from ventilation, Smith, 1143; Whittell, 1238-1244; Robertson, 1729.
- drainage of cellars becoming the rule, Mestayer, 1489.
- optional, Whittell, 1235.
- early institution of, followed by increase of mortality, Way, 1668.
- fall in sewers, Mestayer, 1396, 1456; see also Appendix.
- fellmongers give trouble to, Mestayer, 1482.
- general depth of the, Mestayer, 1490.
- mortality prior to inception of, Whittell, 1198.
- Government inspection for plumbing, Smith, 1098.
- improvement in the sanitary condition from, Sprod, 1252, 1323.
- licensing of plumbers, Smith, 1099.
- main sewers egg-shaped and of concrete, Bayer, 1553.
- nature of drainage into, Mestayer, 1472-1477.
- noxious trades connected with, Smith, 1123-33.
- preventable diseases would be lessened if suburbs were connected with, Sprod, 1289.
- plumbing effectively done, Bayer, 1558, 1562.
- reduction in mortality since conclusion of, Smith, 1085; Way, 1670.
- results of, Smith, 1085.

Adelaide deep drainage, *continued*—

- silting, Smith, 1114.
- subsoil waters not taken, Whittell, 1231.
- water-closets connected on payment of fee, Smith, 1133, 1066.
- zymotic diseases less prevalent after completion of, Robertson, 1720.
- Adelaide Sewage farm, see Sewage farm.
- Advantages of present site of city abattoirs, Fitzgibbon, 4576.
- removing city abattoirs, Urie, 261.
- site at Doutta Galla, Fitzgibbon, 4578, 4580.
- Alienated land within catchment area of Yan Yean reservoir, Davidson, 6501.
- Albert Park lagoon, Robertson, 5976-5980.
- Alteration, cost of, from present system to water-closets, Barlow, 34-40.
- Analysis of drinking water should be made, Simpson, 5619.
- of Saltwater river, Urie, 274.
- water supplied to Adelaide, Whittell, 1623; p. 66.
- Apathy of local board, Keeble, 5746; Buchan, 6646-52; Eassie, 3310, 3312, 3314, 3382.
- Appointment of inspectors, Willing, 5387, 5389, 5408.
- health officers, Simpson, 5693, 5704.
- Arbitrators, power to settle claims by, should be taken, Bennett, 2256.
- Area at present used as gathering ground for Melbourne water supply, Davidson, 6611.
- Adelaide Sewage farm, Colebatch, 1871-73.
- Botany Sewage farm, Bagge, 2449, 2551.
- Arrangements for disposal of night-soil, Robertson, 1742; Eassie, 3397-3403; Fullarton, 6114-6122.
- of cattle traffic, Cattanaich, 486; Trenchard, 4221-30; Reynolds, 3901; Dougharty, 4350-52.
- Atmosphere of abattoirs saturated with septic germs, Dickinson, 626; Bowser, 3201-3207.
- pure, Bennet, T. K., 3993; Woolcock, 4123, 4124; Reynolds, 3886.
- Attempt to abate fellmongery nuisance, Husband, 5317-5321; Bage, 5329.
- to find another site for abattoirs, King, 4520.
- Attention, constant, required for earth-closets, Barlow, 16.
- Available sites for abattoirs, Dickinson, 632.
- Backhouse, B., Chairman of City of Sydney Improvement Board, evidence of, 3178-3184.
- Bagge, C. H. O., chief assistant engineer of Sewage Board, evidence of, 2367-2460.
- Bage, Dr., evidence of, 5326-5362.
- Baltimore, meat supply of, one abattoir only for, Willing, 5387, 5397.
- Bancroft, Dr., sanitary medical officer for Brisbane, evidence of, 2584-2618.
- Barlow, C., partner large engineering firm, London.
- evidence of, explaining views on drainage of Melbourne, 1 to 131.
- Bayer, C. A., sanitary engineer of Adelaide, evidence of, 1549-1594.
- Benjamin, R., evidence of, Mayor of Melbourne, 4560-4566.
- Bennett, W. C., commissioner and engineer-in-chief of roads, N.S.W., evidence of, 2199-2566, 2946-2988.
- Bennet, T. K., evidence of, 3943-4102.
- Bennet's sheep-killing place at abattoir, Gee, 699-706.
- Best process for chilling meat, Playfair, 3834, 3829.
- Binney, H., evidence of, 4861-4923.
- Blasting, power for, Bennett, 2241.
- Board, Local Government, report to, 1876, Barlow, 10.
- Board of Health, Brisbane, Bancroft, 2508-24.
- central, Keeble, 5748-50, 5752; Buchan, 6648, 6654, and 6667; Fitts, 1015.
- local, Keeble, 5746; Eassie, 3310, 3312, 3314, 3382; Gomm, 6286; Buchan, 6646; Bage, 5329; Cattanaich, 530.
- provincial, Simpson, 5593, 5600.
- Sydney, MacLaurin, 2823-25.
- has no power over the sewerage or drainage, MacLaurin, 2869.
- Boiling-down works, cause of smell from, Waddell, 938.
- drain from, to river, Waddell, 923.
- need be no offence from, Waddell, 923, 941; Fitts, 1017-19, 1029.
- no smells from, if conducted properly, Waddell, 895.
- prevention of smell, Waddell, 892.
- untenable if abattoirs removed, Waddell, 945.
- Bondi sewer, course of, Bennett, 2262-2277.
- difficulties met with, Bennett, 2234-2243; Bagge, 2374-76.
- form and construction of, Bennett, 2292, 2315.
- outlet works of, Bennett, 2278, 2287.
- ventilation of, Bagge, 2377, 2391.
- Bone-mills and slaughter-house a nuisance at Footscray, Gomm, 6279, 6281; Kitchen, 6367-83; McCarthy, 6439.
- Borthwick, Dr., evidence of, 1762-1830.
- Botany, outfall of southern drainage system of Sydney, Bennett, 2262; see Sewage farm.
- Bowser, Dr., health officer for Shire of Braybrook, evidence of, 3189-3283.

- Box drain composed of pine and thoroughly tarred, Mestayer, 1505.
no offence from, at Sewage farm, Mestayer, 1507.
- Brady, J., evidence of, 5123-5141.
- Brands taken at abattoirs, Robertson, 732.
put on meat, Bowser, 3248-52.
- Brisbane Board of Health, Bancroft, 2504-24; liquid sewage runs into river at, Bancroft, 2543.
mode of dealing with excremental sewage at, Bancroft, 2525.
salt water pumped through sewers daily from river, Bancroft, 2588.
ventilation of sewers in, Bancroft, 2548.
water supply, Bancroft, 2550.
catchment area completely reserved, Bancroft, 2551.
- Buehan, J., evidence of, 6657-6669.
- Buck's scrapers for levelling land, Colebatch, 1850; Mestayer, 1527.
- Buildings at city abattoirs, Cattanaach, 428.
unsuitable, Taylor, 1983, 1984, 1986; Bowser, 3208; and see Abattoirs.
- By-law for regulating cattle traffic, Urie, 362-365.
to regulate compulsory notification of infectious diseases, Borthwick, 1807.
- Caleutta abattoirs, Bowser, 3243, 3256; Simpson, 5605-5614.
sanitary administration of, Simpson, 5603.
condition of, Simpson, 5593.
sewerage of, 5683.
treatment of house refuse at, Simpson, 5617.
night-soil at, 5675-80, 5683.
water supply, Simpson, 5626-34.
- Caldwell, H. M., evidence of, 2206-2198.
managing director Cattanaach Chemical Works, 2107.
- Carcasses, number condemned during 1887, Gee, 678.
- Carting of pelts to fellmongeries, Husband, 5304.
- Cast-iron pipes, Mestayer, 1494.
manufactured in Adelaide, Mestayer, 1495.
- Catchpit near Moonee Ponds, Urie, 302, 316; Cattanaach, 455-467.
- Cattanaach, W., evidence of, 411-548.
deodoriser, Roser, 2817; Jager, 2746.
- Cattle, accommodation-paddocks for, Cattanaach, 418.
brands and numbers taken, Gee, 651.
brought by train to abattoirs at Munich and Berlin, Service, 4182.
bruising in trucking, Playfair, 3812-14.
danger in streets from, Urie, 259, 357, 365; Dickenson, 628, 634; Cattanaach, 486-488.
difficulty in getting them fed, Gee, 667.
food at abattoirs for, very inferior, Taylor, 1965.
from Orange, Evans, 3529.
inspection of, before killing, Gee, 677.
in mud in paddocks at abattoirs, Urie, 252, 255.
no shelter for, at abattoirs, Robertson, 807.
not fed at abattoirs, Cattanaach, 499, 501.
number slaughtered, Gee, 643.
proposal to bring by rail to abattoirs, Robertson, 864, 872.
require rest before killing, Dougharty, 4353; Bennet, T. K., 4040; Palmer, 5489; Reynolds, 3914.
time kept in paddocks, Taylor, 1964; Cattanaach, 540; Gee, J., 665; Bennet, 4099; Pritchard, 4992-5001-3; Reynolds, 3901, 3914; Richards, 3662; Palmer, O., 5489.
to private slaughter-houses, Gee, 646-650.
traffic, Reynolds, 3901; Trenchard, 4229-4230; Dougharty, 4350-52.
traffic in streets, Dickinson, 628; Cattanaach, 486-488.
trucking of, see trucking.
watered and fed, Gee, 658.
yards altogether too small, Cattanaach, 540.
and abattoirs at Kensington, Trenchard, 4203.
at South Melbourne abattoirs, Smith, 4778, 4782.
attempt to find another site for, King, 4520.
condition of, Taylor, 1954-1969.
council object to, Urie, 259.
depreciate property, Urie, 513.
drainage of cattle-yards and district, Urie, 297, 318.
into silt pit, Cattanaach, 449-468.
of west part of, Cattanaach, 474.
Government inspector at, Robertson, 797.
number of stock through, Gee, 643-650.
railway to, Bennet, 4088-93.
revenue from, Fitzgibbon, 4701.
siding to, Fitzgibbon, 4601-3, 4607-8; Pritchard, 5005; Trenchard, 4223; Dougharty, 4452, 4453; Speight, 6217.
- Cellars, Fullerton, 6145.
drainage of, in Adelaide, Whittell, 1235; Mestayer, 1489.
mode and importance of drainage of, Barlow, 121.
- Central abattoirs essential, Reynolds, 3914, 3924.
- Cesspits, Robertson, 6007; Fullerton, 6164.
in Adelaide, Smith, 1052-54, 1059-61; Whittell, 1190; Way, 1631-36.
- Channels, street, in Melbourne, Simpson, 5647; Eassie, 3330; Robertson, 5986-91.
- Character of pig-pens, Grimes, 4928-33.
- Charges for chilling meat, Playfair, 3837-38; Richards, 3716.
- Chief sources of meat supply of Melbourne, Trenchard, 4210-4220; Reynolds, 3896-3900; Bennet, 4001-3.
- Chicago slaughter-houses, Service, 4185-4192.
slaughtering done by private persons, Urie, 410.
- Chilled meat trade, Trenchard, 4296, 4312, 4326; Reynolds, 3917-3921; Palmer, O., 5482; Bennet, 4043-4046; Woolcock, 4143, 4144, 4147, 4150, 4152, 4154, 4167, 4172; Evans, 3532, 3533.
- Chilling meat, Kenway, 2663, 2621; Richards, 3668, 3680, 3692, 3699-3709, 3716; Playfair, 3829, 3830-3842; Palmer, O., 5540.
- Choking of house drains, Smith, 1115-1118.
- Claims for compensation should be settled by arbitrators, Bennett, 2256.
- Clark, E., town clerk of Port Melbourne, evidence of 5432-5475.
- Cleansing of abattoirs, Gee, 685-688; Robertson, 732, 768.
streets, Eassie, 3361.
- Cleanliness of abattoirs, Bennet, 3965-71, 3975; Taylor, 1979-1981.
- Closets, cost of alteration, Barlow, 34.
(earth) require constant attention, Barlow, 16.
- Closet, water system, Adelaide, Smith, 1051-54.
amount of water required for, Bayer, 1585.
waste water, Bayer, 1582.
- Coast hospital, Sydney, MacLaurin, 2872, 2876-80.
- Cohn, J., evidence of, 5198-5227.
- Coldcars, Kenway, 2621, 2692; Richards, 3699; Speight, 6227-34.
- Colebatch, T., manager, Sewage farm, Adelaide, evidence of, 1831-1890.
- Collingwood tip, Buehan, 6622.
drain at, Buchan, 6662-66.
- Commission appointed to inquire into sanitary condition of Adelaide, Whittell, 1197.
- Committee, river pollution, 1867, Barlow, 10.
- Como swamp, Robertson, 5975.
- Compensation for removal of abattoirs, Gomm, 6325, 6328, 6330, 633.
of fellmongeries, Husband, 5321.
of noxious trades, Kitchen, 6410-14, 6416-20.
- Complaints against abattoirs, Urie, 261.
of smell from abattoirs, Robertson, 847.
- Concrete, main egg-shaped sewers constructed of, Bayer, 1553.
- Condemed, number of carcasses, Gee, 678.
- Condition of, city abattoirs, see Abattoirs.
Port Melbourne abattoirs, Prohasky, 5413, 5420.
South Melbourne abattoirs, Smith, 4756.
Williamstown abattoirs, Craig, 5249, 6265, 5271.
river banks, Cattanaach, 479, 481, 484, 485.
the tanneries at Footscray, McCarthy, 6465, 6483; Kitchen, 6389-91.
trades at Footscray, McCarthy, 6433.
- Conferva, occasional offensiveness of water supply through growth of, Davidson, 6578.
- Connexion of closets, &c., with sewers, Adelaide, Mestayer, 1413-23.
houses with sewers, Sydney, Jones, 3139-3151.
noxious trades with Adelaide deep drainage, Smith, E. T., 1123-33.
old sewers with new, Sydney, Jones, 3163.
with sewers tested, Bayer, 1565-69.
- Contamination of subsoil, Barlow, 121-123; Simpson, 5646, 5653; Fullerton, 6161.
water supply in progress through city not possible, Davidson, 6630.
- Cook's Point, site proposed for abattoirs at, Urie, 377.
- Cost of Adelaide drainage to ratepayers, Smith, 1134; Way, 1706, 1707; Robertson, 1758-61.
chilling meat, Richards, 3716; Kenway, 2621; Playfair, 3837-38.
disposal of refuse, Farmer, 209.
Hesse's system, 3456-62.
legal proceedings prohibitive, Gomm, 6297, 6300.
north shore sewerage system, Bennett, 2977.
proposed improvements at city abattoirs, Fitzgibbon, 4647.
removal of night-soil, Barlow, 26, 27.
Sydney sewerage, Bennett, 2366.
- Counsel's opinion on nuisance at Walker's candle factory, Buchan, 6648.
- Course taken by cattle before slaughter, Reynolds, 3901.
- Country-killed meat, Fitzgibbon, 4720-22-24; Bennet, 4035, 4053; Woolcock, 4140, 4156; Pritchard, 5030, 5063; Playfair, 3807, 3829; Richards, 3663, 3666; Reynolds, 3914, 3923; see also dead meat trade and chilled meat.
- Country-killing establishments should be in private hauds, Playfair, 3844; Reynolds, 3922; Pritchard, 5052; Woolcock, 4145-51; Bennet, 4047, 4051.
no difficulties in transit of meat from, Speight, 6263.
producers approve of, Palmer, 5526.
should be combined with town-killing, Playfair, 3822.

Country-killing *continued*—

- objections to, Playfair, 3816, 3821; Trenchard, 4203, 4302, 4326; Dougharty, 4387, 4422, 4428; Howat, 4465, 4506; King, 4537, 4555.
- Country meat trade in New South Wales, Kenway, 3481, 3486, 3482; Evans, 3529-3575.
- Covering of meat in transit, Taylor, 2050, 2054; Elmslie, 2090-2093; Jamieson, 5822-29.
- Cows on swamp, Fullerton, 6173, 6183.
 - keeping of, in the city, Eassie, 3279; Robertson, 5970.
- Craig, F., evidence of, 5248-5276.
- Cutting of timber causes a diminution in volume of stream, Davidson, 6564.
- Danger to pedestrians by cattle traffic, Urie, 357, 3671; Cattanaich, 486; Dickenson, 626, 636.
- Dansey, Dr., evidence of, 3054-3136.
- Dairy farms, Simpson, 5636, 5637.
- Dairies, Fullerton, 6069, 6078; Eassie, 3313; Robertson, 5920-31.
- Davidson, W., superintending engineer, Melbourne water supply, evidence of, 6499-6636.
- Dead meat trade, Evans, 3529-3575; Willing, 5372, 5374, 5385; Palmer, O., 5478, 5544; Palmer, McLeod, 5577, 5583.
 - cattle and sheep from Orange, Evans, 3529.
 - mutton from Goulburn, Evans, 3542.
 - results satisfactory, Evans, 3534-37, 2559-61.
 - treatment of the cattle, Evans, 3563, 3575.
- Death of Mr. Howgate attributed to defective plumbing, Smith, 1097.
- Death rate of Adelaide, Smith, 1072-75, 1069; Whittell, 1198; Way, 1670; Robertson, 1750, 1752; Sprod, 1307-1312.
 - in urban and country districts, 1877 to 1887, Hayter, 1913.
 - of Kensington and Norwood, Borthwick, 1797.
- Deaths from diarrhoeal diseases, Melbourne and suburbs, Hayter, 1935.
 - typhoid fever, Melbourne and suburbs, Hayter, 1935.
- Deep drainage by water system, objections to, Barlow, 128; see under Adelaide and Sydney.
- Defects in city abattoirs, Cattanaich, 418; see Abattoirs.
 - in deep drainage scheme from sanitary aspect, Whittell, 1237-1244.
- Health Act, Eassie, 3294.
- Defective plumbing, Smith, 1094; see Adelaide drainage.
- drainage of South Melbourne abattoirs, Smith, 4759, 4771.
- Depreciation in value of property, Urie, 261.
- Deputation *re* noxious trades, Gomm, 6273, 6274.
- Description of Adelaide before drainage system, Whittell, 1190-1197; Smith, 1049, 1070; Way, 1630, 1666.
 - Copenhagen abattoirs, Cohn, 5202-5227.
 - Glebe Island abattoirs and its accessories, Kenway, 2621.
 - Hesse's system of dealing with night-soil, Hesse, 3420-3464.
 - inlet works at the Southern sewage system, Bagge, 2432.
 - management of Calcutta abattoirs, Bowser, 3243, 3256; Simpson, 5605-13.
 - revolving strainers at Sewage farm, Mestayer, 1503.
 - rock passed through in tunnelling, Davidson, 6619.
 - Sewage farm, see sewage.
 - the works at the outfall at Bondi, Bennett, 2278-85; at Botany, Smail, 2992, 3012.
 - traffic in Watts River watershed, Davidson, 6540-49, 6556-59.
 - ventilation for water-closet, Mestayer, 1415, 1434.
 - water-closet, connexion with main sewer, Mestayer, 1413; Jones, 3139.
- Desiccating works at city abattoirs objectionable to Footscray, Kitchen, 6421, 6432.
- Desiccation of night-soil, Bancroft, 2590-94.
- Desiccators, city abattoirs, Urie, 352-355; Fitzgibbon, 4590.
 - Glebe Island abattoirs, Roser, 2781-92, 2803-17, 2814, 2816; Kenway, 2621.
 - Sydney Meat Preserving Works, Auburn, Gee, A., 2464, 2467.
 - Fryer's, Simpson, 5676.
- Desire of City Council to improve abattoirs, Benjamin, 4560.
- Destructor for house refuse, Simpson, 5617.
- Details of the works of tallow factory, Fitts, 962, 982.
- Dickinson, Dr., evidence of, 549-634.
- Difficulties in administering Act as to unwholesome food, Fullerton, 6066.
 - carrying out duties, Eassie, 3290.
 - way of country killing becoming general, Playfair, 3816, 3822; see Country killing, objections to.
 - ventilating sewers, Barlow, 128.
- Disinfectants, Eassie, 3375; Fullerton, 6801-88.
- Disposal of night-soil of houses near Adelaide, catchment area, Robertson, 1742.
 - of Melbourne and suburbs, Eassie, 3390, 3407; Fullerton, 6114; Robertson, 5968-70.
- Distance from sale-yards to abattoirs, Robertson, 875.
 - meat can be brought without chilling, Kenway, 3514-16-17-18; Richards, 3710, 3711.
- Donovan, F. W., evidence of, 5064-5092.
- Dougharty, Hon. J. G., evidence of, 4349-4459.
- Doutta Galla site, advantages of, Fitzgibbon, 4578-4580.
- Drains at abattoirs, Taylor, 1954.
 - bad use of, will occur in any system, Smith, 1117.
 - Board of Works would require power to open up for, Barlow, 108.
 - from abattoirs, Dickinson, 581-585.
 - house, choking of, Smith, 1115-18.
 - main, earthen pipes for, Smith, 1119.
 - ventilation of, Barlow, 131.
- Drainage of abattoirs, Dickinson, 556, 580; Cattanaich, 418-422; Taylor, 1970-1978; Jamieson, 5776-79; Bennet, 3954; Urie, 263; and factories connected with deep drainage system in Adelaide, Smith, 1123.
 - alienated lands within immediate catchment area of Yan Yean reservoir, Davidson, 6502.
 - Port Melbourne abattoirs, Prohasky, 5416, 5417.
 - South Melbourne abattoirs, Smith, 4759, 4771.
 - Williamstown abattoirs, Smith, 5293, 5294.
 - boiling-down works, Waddell, 923.
 - bone-mills, Binney, 4892, 4896, 4899.
 - cattle-yards, Urie, 297, 318; Cattanaich, 449.
 - cellars, Barlow, 121-123; Whittell, 1235; Mestayer, 1489.
 - earthenware pipes for, liability to fracture, Barlow, 64-68.
 - effects of, on health, Simpson, 5735-40.
 - Fitzroy, Eassie, 3329, 3350.
 - for slops must be made, Barlow, 14; Simpson, 5682.
 - into Albert Park lagoon, Robertson, 5976-5980.
 - kind of main pipe for, Barlow, 56-59.
 - Melbourne, Barlow, 5; Simpson, 5646-54, 5672; Fullerton, 6151-6159.
 - new localities, Robertson, 5990.
 - objections to deep-water system of, Barlow, 128.
 - outfalls for, at Mordialloc and Laverton, Barlow, 72-90.
 - Prahran, Robertson, 5972, 6004.
 - Royal Commission on separate system of, Barlow, 10.
 - Sir J. Bazalgette condemns earthenware pipes for, Mestayer, 1398.
 - tallow factories could be improved, Fitts, 984.
 - into a receiver, Fitts, 1006.
 - deep system, in Adelaide; see Adelaide.
- Driving cattle to yards, Trenchard, 4228.
- Drying of refuse of bone-mills, Binney, 4884.
- Dues collected monthly for slaughtering, Gee, 676.
 - for making rights-of-way, Eassie, 3298.
- Dunn, T., evidence of, 5112-5122.
- Duty of the corporation to remove refuse from abattoirs, Taylor, 2018.
- Duties, at abattoirs, Robertson 731, 784.
 - of inspectors of nuisances of Melbourne, Fullerton, 6059, 6065; Fitzroy, Eassie, 3289; Prahran, Robertson, 5911-17.
- Dwellings nearest to abattoirs, Urie, 319.
- Earthenware pipes, experience with, Barlow, 64.
 - liability to fracture, Barlow, 64-66.
- Earth-closets, contaminate air, Barlow, 15.
 - cost of altering to water-closets, Barlow, 34.
 - require constant attention, Barlow, 16.
- Eassie, C. J., sanitary inspector for Fitzroy, evidence of, 3284-3408.
 - duties as, 3287-89.
- Echuca, people would have abattoirs, Urie, 375.
- Effects of abattoirs and noxious trades on health, Dickinson, 596-600; Bowser, 3202, 3236-40; Bage, 5328; McCarthy, 6456-64; Jamieson, 5798-5802; Palmer, 5546; Fitts, 1036.
 - burying of offal at abattoirs, Dickinson, 559, 589, 627.
 - chilling on meat, Bennet, 4044; Playfair, 3830-3832.
 - fire on fumes from bone-mills, McCarthy, 6445.
 - mode of burying offal, Dickinson, 559, 589, 627.
 - one central abattoirs, Penhallurick, 6029, 6040.
 - removal of abattoirs, Waddell, 942, 947, 950.
 - sewage on river, Bancroft, 2604-15.
 - sewage farm, on health of neighbourhood, Whittell, 1595-1606; Way, 1685-95; Robertson, 1735-39; Sprod, 1360-69.
 - water carriage system of sewage on Melbourne water supply, Davidson, 6568.
- Efforts to minimize the nuisance at Footscray, McCarthy, 6441.
- Elevated, abattoirs should be, Kenway, 2674, 2681.
- Elmslie, H., valuer and collector of Flemington and Kensington, evidence of, 2066-2105.
- Exciting cattle by driving, Palmer, 5494-98.
- Evans, J., evidence of, 3527-3575.
- Examination of water-pipes, Davidson, 6585.
- Excreta, Sir James Farmer's system for, 134, 144.
 - no objection by tenants to Farmer's system for, Farmer, 60.
 - never any municipal or other systematic arrangement for removal of, in Adelaide, Smith, 1140.
- Expense, calculation of, of water carriage system, Barlow, 49-54.
- Extension of Kensington northwards, abattoirs a bar to, Dickinson, 628.

- Extra quality of country killed meat, Palmer, 5512
- Fall of drain not sufficient at abattoirs, Dickinson, 562.
in main drain, in system for Melbourne, Barlow, 111.
in sewers, Adelaide, Mestayer, 1396, 1450; Sydney, Bennett, 2267, 2358; Melbourne, Barlow, 111.
- Farm, Sewage, Adelaide, Sprod, 1278, 1285, 1360, 1378; Mestayer, 1498, 1534, 1538, 1543; Whittell, 1595, 1601; Way, 1686, 1691, 1696, 1698; Robertson, R., 1735, 1739; Colebatch, 1832, 1890.
- Botany, Bennett, 2262, 2351; Bagge, 2432, 2459; Smail, 2992, 3053; Dansey, 3069, 3072.
complaints of bad smell from, at Adelaide, Sprod, 1280.
Mordialloc soil favorable for, Barlow, 74.
size required for, Barlow, 110.
- Farmer, Sir J., firm of Sir J. Farmer and Sons, London, evidence of, 132-242.
- Farmer's system treating night-soil and refuse collection, Farmer, 133.
cause no offence, Farmer, 160.
cost, Farmer, 185.
description of works at Birmingham, Farmer, 135-242.
machines can be used for offal, Farmer, 232.
product of, sold as manure, 233.
treatment, Farmer, 152, 231, 242.
works are in city, Farmer, 210.
- Feeding pigs on blood, Palmer, 3564, 3567; Grimes, 4953-62.
- Fellmongeries on Yarra, Robertson, 6013-15; Husband, 5302-5309.
injurious to health, Bage, 5328.
proceedings by local board, Bage, 5329-40-57.
- Fever in Aberdeen, Simpson, 5647-52.
typhoid, see Typhoid.
- Filling in of paddocks at abattoirs, Mountain, 5174, 5182.
- Fitts, A. W., tallow and glue manufacturers, evidence of, 951-1038.
- Fitzgibbon, E. G., town clerk of Melbourne, evidence of, 4572-4753, 5228-5247.
- Fitzroy (city), main streets, sweep daily, Eassie, 3361.
pans emptied weekly, Eassie, 3351.
refuse matter trenched in Edinburgh gardens, Eassie, 3362.
- Flemington and Kensington Council does not wish to have abattoirs removed, Cattanaach, 530, 535.
- Flock factories, Jamieson, 5892.
- Flooding of abattoirs periodically, Dickinson, 628.
noxious trades, Dickinson, 623.
- Floor of abattoirs at Glebe, Kenway, 2641.
raised, Richards, 3603, 3604, 3615; Gee, 2501.
- Floors at city abattoirs, Woolcock, 4114; Bennet, 3956-68.
height of, above water-level, Mountain, 5192.
of abattoirs, Playfair, 3850; Richards, 3606, 3608; Kenway, 2621.
raised for abattoirs, Richards, 3604, 3606, 3615; Howat, 4464.
- Flush, two gallons water per closet, Bayer, 1585.
- Footscray bone-mills and slaughter-houses a nuisance, Gomm, 6279, 6280; McCarthy, 6439; Kitchen, 6367.
condition of trades at, McCarthy, 6453.
tanneries at, McCarthy, 6465-6480.
deputation re trades at, Gomm, 6273, 6274.
desiccating works at city abattoirs objectionable to, Kitchen, 6428-32.
drinking water used at, McCarthy, 6489-90.
efforts to minimize nuisances at, McCarthy, 6441.
effect of fire on fumes from bone-mills at, McCarthy, 6445.
infantile mortality at, McCarthy, 6483-85.
offence from noxious trades at, McCarthy, 6439.
opposition to noxious trades at, McCarthy, 6454, 6455.
private abattoirs should be removed from, Gomm, 6310.
difficulties in removing them, Gomm, 6311.
prevalence of zymotic diseases at, McCarthy, 6486, 6462, 6463.
site of noxious trades at, McCarthy, 6453.
supervision of noxious trades at, Gomm, 6285.
smelting works at, McCarthy, 6447-52.
smell from rotten meat at, McCarthy, 6487, 6494-97.
- Fracture, liability to, of earthenware pipes, Barlow, 64-68.
- Freights on live stock, Speight, 6189.
dead meat, Speight, 6191.
- Fullerton, J., evidence of, 6057-6181.
- Furnace for boiling down without offence, Miller, 6268-6271.
- Guarantee of no offence if secure tenure for factory, Fitts, 1033.
- Gee, Alban, manager, Sydney Meat Preserving Co., evidence of, 2461-2503.
- Gee, John, superintendent City Abattoirs, evidence of 625-729.
- Gomm, J., town clerk, Footscray, evidence of, 6272-6309.
- Goulburn meat trade, Evans, 3544.
- Government, abattoirs would be better in hands of, Urie, 398.
commission appointed to inquire into sanitary condition of Adelaide, 1876, Whittell, 1197.
inspector for inspection of plumbing, Smith, 1098.
at city abattoirs, Robertson, 796.
- Griffin, J. G., mayor of Manly, evidence of, 2916-2945.
- Grimes, S. K., evidence, of 4924-4971.
- Hanging bars for meat, Kenway, 2621; Trenchard, 4302.
- Harbour Trust, cause of defective drainage at abattoirs, South Melbourne, Smith, 4764.
works on river bank and abattoirs, Brady, 5124.
- Hayter, H. H., Government Statist, evidence of, 1891-1950.
- Health, board of; see Board.
- Health, effect on, of abattoirs, Dickinson, 596-600; Bowser, 3236-3240.
effects on, of noxious trades, Dickinson, 596-600; Jamieson 5798-5802; Bage, 5328-5329; McCarthy, 6456-64; Palmer, T., 5546, 5547; Fitts, 1036.
of Flemington and Kensington, Urie, 261, 321-323; Cattanaach, 532.
of the city has a marked influence on the health of the suburbs, Way, 1682.
authorities, Sydney, no control over sale of unwholesome meat, MacLaurin, 2866.
officers, appointment of, Simpson, 5693, 5704.
should be qualified, 5696.
- Hesse, L., contractor for removal of night-soil, St. Kilda, evidence of, 3409-3475.
- Hesse's system, description of, Hesse, 3420-55; cost of, 3456-62; no nuisance, 3464.
- Height of Adelaide at post-office, Smith, 1142.
- Hindmarsh ward, mortality of, Way, 1676.
attributed to hospital and lunatic asylums, Way, 1676.
- History of abattoirs, Fitzgibbon, 4596.
- Holton, B., evidence of, 5093-5099.
- House refuse, Eassie, 3362; Simpson, 5617.
- Houses near Yan Yean reservoir, Davidson, 6576, 6529.
- Howat, G., evidence of, 4460-4507.
- Husband, W. H., evidence of, 5299-5322.
- Improvements at city abattoirs, Fitzgibbon, 4582-4591; Taylor, 1954; Mountain, 5147, 5173.
of sanitary condition of Adelaide due to deep drainage, Sprod, 1252.
in mortality statistics largely due to deep drainage, Sprod, 1322.
- Inaction of local board in removing nuisance, Keeble, 5746, 5747.
- Income, Farmer's machine a source of, Farmer, 226.
- Increased cost in transit in country killing, Howat, 4470.
- India, sanitary administration of, Simpson, 5589-5604.
- Infectious diseases, Fullerton, 6079; Robertson, 5936-39; Sprod, 1350-59; Whittell, 1608-10; Dansey, 3093-98; MacLaurin, 2823, 2858-2863.
by-laws to regulate compulsory notification of, Borthwick, 1807.
- Inferior food for cattle at abattoirs, Taylor, 1965.
- Influence of cattle-yards and abattoirs on State schoolchildren, Elmslie, 2070-2090.
- Inhabitants per acre for a sewage farm, Mestayer, 1538; Barlow, 110; Colebatch, 1871.
- Injury to beasts in trucking, Bennet, 4023-32.
to stock in transit, Speight, 6203.
- Inspector sent by council, Fitts, 992.
- Inspectors, duties of, Gomm, 6356, 6358; Eassie, 3287; Fullerton, 6059; Robertson, 5911.
not enough, Eassie, 3308-10.
- Inspection of abattoirs, Jamieson, 5809, 5822-30; Pritchard, 5013, 5015-20; Playfair, 3862.
and control of city abattoirs, Urie, 387, 388.
cattle, Gee, 677-684.
meat, Prohasky, 5428-5431; Bennet, 3996-4000; Reynolds, 3889-3895; Taylor, 2046-2049.
noxious trades, Cattanaach, 526.
plumbing work, Mestayer, 1441; Sprod, 1273; Bayer, 1562.
stock, Robertson, 791.
suburban abattoirs, Woolcock, 4159-63.
- Instruction as to duties, Gee 636, 642.
- Introduction of noxious trades to Footscray, Kitchen, 6399, 6409.
no opposition to, Kitchen, 6403.
- Insufficient accommodation at abattoirs, Pritchard, 4975, 4976.
- Jager, J., superintendent, abattoirs, Glebe Island, Sydney, evidence of, 2718-2777.
- Jamieson, Dr., evidence of, 5767-5908.
- Jones, J. Trevor, engineer to Metropolitan Board of Water and Sewage, Sydney, evidence of, 3137-3177.
- Keeble, J., evidence of, 5742-5766.
- Keeping of cattle at abattoirs, Gee, 658-690; see Cattle.
pigs at abattoirs, Grimes, 4953-62.
- Keilor Plains, site proposed for abattoirs at, Urie, 377; Dickinson, 632.
- Kennon, S., evidence of, 5100-5111.
- Kensington and Norwood, backyard refuse removed by scavengers, Borthwick, 1775.
cesspit system at, Borthwick, 1767.
death rate for, Borthwick, 1797.
drainage very good, Borthwick, 1788.
street channels paved and cemented, Borthwick, 1786.

- Kensington, abattoirs a bar to extension northwards of, Dickinson, 628.
- Kenway, A. G., evidence of, 2619-2717, 3476-3526.
- Killing in country, possible and advantages, Reynolds, 3914-23; see also Country killing, dead-meat trade, 3937-3839.
- pens grouted in cement, Grimes, 4937.
- pigs at abattoirs, Grimes, 4969.
- sheds, use of lime at abattoirs in, Dickinson, 568.
- King, A. S., evidence of, 4508-4557.
- Kitchen, R. W., evidence of, 6360-6432.
- Kruse's analysis of water from Saltwater River, Urie, 276.
- Labour difficulties, King, 4553.
- Land at Keilor Plains for abattoirs, Dickinson, 633.
- Lands alienated long before reservoir was built, Davidson, 6509.
- Lands Department, silt pit under control of, Cattnach, 464.
- Laverton, site for sewage farm, Barlow, 72, 90.
- Levels of sewage farm must be carefully laid out, Colebatch 1844; Mestayer, 1526.
- Level, high and low system of drainage, Barlow, 10.
- Licensed noxious trades, Cattnach, 526.
- noxious trades, yearly by Flemington Council, Fitts, 997.
- plumbers, Smith, 1099; Bayer, 1559.
- Liernur system of pneumatic drainage, Backhouse, 3180.
- Lime, use in killing sheds at abattoirs of, Dickinson, 568-69.
- Liquid sewage runs into river at Brisbane, Bancroft, 2543.
- Local Government Board, report to, Barlow, 10.
- London meat trade, Pritchard, 5047-5051; Speight, 6186-88, 6258-59.
- markets, Fitzgibbon, 4733, 4740-42.
- Losses in trucking cattle, Palmer, 5526, 5527.
- Lodging-houses, Eassie, 3314.
- Machine, cost of, Farmer, 185.
- Main pipe, kind of, for sewers, Barlow, 56-59.
- Management and cleansing of abattoirs, Fitzgibbon, 4679.
- defects in, at abattoirs, Cattnach, 418.
- Manly, sanitary arrangements of, Griffin, 2917-2945, Bennett, 2960-2970.
- Manufactured, everything sent out of tallow factory is, Fitts, 996.
- Manufactories frequently the cause of high consumption of water, Mestayer, 1470.
- Manure, product of Farmer's machine sold as, Farmer, 233.
- Manure works, &c., drainage from, Fitts, 986, 992, 1006-1010; Waddell, 923; Binney, 4892, 4896-7.
- effect on health, Fitts, 1036.
- of removal of abattoirs on, Waddell, 942-47.
- mode of conducting, Fitts, 953-981; Waddell, 888-922; Binney, 4864-4872.
- offences could be prevented, Waddell, 928-41; Fitts, 1017-19, 1025-30.
- removal of, Fitts, 1025-78; Binney, 4916-23.
- treatment of refuse at, Fitts, 993; Waddell, 902; Binney, 4884.
- Marine stores not well conducted, Jamieson, 5860.
- Materials received at bone mill, Binney, 4864.
- Material from Melbourne and suburbs for tallow factory, Fitts, 1026.
- Mean population and deaths in Melbourne and suburbs (Greater Melbourne), 1877 to 1887, Hayter, 1896.
- population and deaths in Australasian capital cities (including suburbs), 1877 to 1887, Hayter, 1903.
- Meat market, Darling Harbour, Kenway, 2697-2711.
- trade in Baltimore, Willing, 5369.
- London, Pritchard, 5047; Speight, 6186.
- Portland, Willing, 5384.
- of New York, Willing, 5382.
- N.S.W.; see Dead meat.
- covering of, in transit from abattoirs, Taylor, 2050-2054; Elmslie, 2090-2093.
- meat supply; see Country, source.
- Melbourne, City Council of, desire to improve city abattoirs, Benjamin, 4560.
- draws a large revenue from abattoirs, Urie, 383.
- drainage of, Barlow, 5.
- profuse use of water in, Mestayer, 1468-71.
- Melbourne Water Supply, alienated land within the catchment area, Davidson, 6501; Simpson, 5618.
- analysis of, necessary, Simpson, 5619.
- area used as gathering ground for, Davidson, 6611.
- condition of gathering ground, Simpson, 5618.
- cutting of timber caused a diminution in volume of streams, Davidson, 6564.
- description of traffic in Watts River watershed, Davidson, 6540.
- description of rock passed through in tunnelling, Davidson, 6619.
- drainage of alienated lands within immediate catchment of Yan Yean reservoirs, Davidson, 6502.
- effect of a water carriage system of sewage on, Davidson, 6568.
- examination of pipes, Davidson, 6585.
- lands alienated long before reservoir was built, Davidson, 6509.
- Melbourne Water Supply, *continued*—
- occasional offensiveness of water through growth of conferva, Davidson, 6598.
- objections against millers on Watts River watershed, Davidson, 6546.
- precautions taking to keep water pure in passage from Dividing Range, Davidson, 6582.
- proposal to cut up alienated lands into allotments, Davidson, 6510.
- rate per head considerably larger than Great Britain, Davidson, 6573.
- risk of pollution, Simpson, 5618.
- sawmilling difficulty in Watts River watershed, Davidson, 6538.
- timber must come down Watts River valley to Melbourne, Davidson, 6549.
- two houses in vicinity of reservoir, Davidson, 6516.
- their distance from reservoir, Davidson, 6529.
- valuation of alienated lands by owners, Davidson, 6532.
- water sometimes analyzed, Davidson, 6890.
- Yarra, reservation of head of for, Davidson, 6613-6617.
- Memorial re fellmongeries on Yarra, Husband, 5302.
- Men at abattoirs should be registered or licensed, Gee, 723.
- Mestayer, R. L., assistant hydraulic engineer, evidence of, 1388-1548.
- description of sewage system, style of drains, &c., 1391-1397.
- Metropolitan sewage discharge, Royal Commission on, Barlow, 10.
- Method of inspection of meat at Sydney abattoirs, Jager, 2720.
- Miles, F. G., town clerk of South Melbourne, evidence of, 4830-4860.
- Miller, J. J., evidence of, 6264-6271.
- Mode of dealing with excremental sewage in Brisbane, Bancroft, 2525.
- disposal of offal, &c., at meatworks, Sydney, Gee, 2469.
- treatment of material at bone-mill, Binney, 4872.
- Moonee Ponds canal, Cattnach, 469-472.
- Mordialloc, site for sewage farm, Barlow, 72-90.
- Mortality of Adelaide, Whittell, 1198; Robertson, 1750; Sprod, 1307.
- after completion of deep drainage a marked falling off in, Way, 1670.
- early institution of deep drainage followed by increase of, Way, 1668.
- from certain diseases in each subdistrict of Melbourne and suburbs, 1887, Hayter, 1929.
- from infantile, Hayter, 1930.
- from miasmatic, septic, and diarrhoeal diseases in Melbourne and suburbs, 1877 to 1887, Hayter, 1924.
- of Hindmarsh ward, Way, 1676.
- attributed to hospital and lunatic asylum, Way, 1676.
- since completion of deep drainage, reduction in, Way, 1685.
- very high prior to deep drainage, Smith, 1069.
- Mountain, A. C., evidence of, 5142-5197.
- Must be near city, abattoirs, Reynolds, 3924.
- Munich and Berlin abattoirs, Service, 4174-4184.
- cattle brought by train to, Service, 4182.
- MacLaurin, Dr. H. N., evidence of, 2820-2907.
- McCarthy, Dr. C. L., evidence of, 6433-6498.
- Nature of his business, Waddell, 888-922.
- pan system and method of removal, Hesse, 2420.
- soil at Sewage farm, Adelaide, Mestayer, 1521; Botany, 3013.
- Necessary improvements to abattoirs, Pritchard, 4978-4984.
- New method for blood and offal, Kenway, 2688.
- Night-soil, arrangement for disposal of in catchment area, Robertson, 1742.
- Melbourne and suburbs, Eassie, 3390-3407.
- checks on, Fullerton, 6115, 6118, 6119.
- cost of removal, Barlow, 26.
- contamination of the air by, Barlow, 15, 17-19, 28-29.
- destination of, Fullerton, 6114; Eassie, 3390-3408; Robertson, 5968-70.
- Farmer's system for, Farmer, 134, 224, 226.
- a source of income, 226.
- Hesse's system for, Hesse, 3412-3475.
- hours for removal of, Fullerton, 6105.
- mode of removal, Fullerton, 6109; Eassie, 3395.
- no disinfectants for, Fullerton, 6124.
- treatment of, Fullerton, 6100-30; Simpson, 5656; Eassie, 3408; Robertson, 5942, 5970; Bancroft, 2590-2603.
- Notice to society for prevention of cruelty to animals, Urie, 256.
- occupiers of noxious trades, Urie, 550.
- Notification of infectious disease, Whittell, 1608-10; Sprod, 1356-59; Borthwick, 1805-14; MacLaurin, 2823, 2858-60, 2867-71.
- Noxious trades, cause of offence from bone-mills, Kitchen, 6368.
- and time it occurs, Kitchen, 6370.
- compensation, Kitchen, 6410-6414, 6416-6420; Gomm, 6325-37.

Noxious trades, *continued*—

condition of, within borough of Kensington, Urie, 261, 339.
 on Saltwater River of, Cattanaeh, 429, 444; Taylor, 5764.
 connexion of, with deep drainage, Smith, 1123-33; Bowser, 3210, 3215, 3225, 3235.
 could be made less offensive, Gomm, 6301.
 deputation to the Premier *re*, Gomm, 6273, 6274.
 drains choked at, Cattanaeh, 442.
 duties of inspectors of, Gomm, 6356-58.
 effect on health of, McCarthy, 6456-64; Jamieson, 5798-5802; Bowser, 3240; Dickinson, 596; Bage, 5328; Palmer, T., 5546.
 on employes of, McCarthy, 6459; Fitts, 1036.
 general condition of, Kitchen, 6381-3.
 in Flemington, well managed, Urie, 341; Cattanaeh, 247.
 inspection of, Cattanaeh, 576; Urie, 350.
 inoffensively carried on in some countries, Urie, 347.
 intense smell comes from, Dickinson, 602.
 licensed and periodically inspected, Cattanaeh, 526.
 might be kept cleaner, Dickinson, 593.
 grouped together, Playfair, 3849.
 nature of offence from, at Footscray, Kitchen, 6372, 6373; McCarthy, 6439-43-46.
 no specific illness from, McCarthy, 6456.
 no opposition to their introduction to Footscray, Kitchen, 6403.
 not prevented by law in Adelaide, Smith, 1170.
 not licensed, Gomm, 6345-48.
 on abattoir land, Fitzgibbon, 4703, 4719.
 on Saltwater River, condition of, Taylor, 5784, 5805; Cattanaeh, 423.
 a nuisance, Urie, 259, 324, 330.
 offence from, at Footscray, McCarthy, 6439; Kitchen, 6367.
 opposition to, at Footscray, McCarthy, 6454, 6455.
 Point Cook suggested as site for, Gomm, 6303, 6304.
 proceedings by local board against, Gomm, 6286.
 question is a public one, Gomm, 6333-6340.
 relation to abattoirs, Playfair, 3847, 3848; Waddell, 945.
 removal of, Kitchen, 6392; King, 4520.
 should not be near abattoirs, Reynolds, 3936; Playfair, 3847.
 site of, at Footscray, McCarthy, 6453.
 strong wish for their removal, Gomm, 6329.
 some very bad, Urie, 344.
 sometimes flooded, Dickinson, 623.
 smells from not injurious to health directly, Dickinson, 596.
 supervision of, Gomm, 6285.
 Nuisances, Fullerton, 6096-98; Robertson, 5940, 5941.
 abattoirs and cattle-yards a, Urie, 255.
 bellowing of cattle a, Cattanaeh, 421.
 candle factory at Collingwood a, Buchan, 6638-45.
 Collingwood tip a, Buchan, 6662.
 fellmongery on Yarra a, Husband, 5302-5309; Bage, 5329.
 municipality has power to prosecute for, Cattanaeh, 530.
 no power to interfere with when outside borough, Urie, 328-333.
 noxious trades a, Urie, 259, 324, 320.
 Number of animals slaughtered, Sydney abattoirs, Jager, 2919.
 preventable diseases would be lessened if suburbs were connected with deep drainage, Sprod, 1289.
 stock yarded at Flemington, Trenchard, 4203.
 slaughtered at city abattoirs, Gee, 643-650.
 Objections against sawmills on Watts watershed, Davidson, 6346.
 none taken by near inhabitants to Farmer's machine in Birmingham, Farmer, 160.
 to abattoirs being retained, Urie, 252; Cattanaeh, 418.
 to the removal of abattoirs, Fitzgibbon, 4783; Trenchard, 4203; King, 4520.
 to country killing, Howat, 4465; Trenchard, 4203; see Country killing.
 Odours arise in Saltwater valley from noxious trades, Trenchard, 4266, 4275; Reynolds, 3884; Bennett, 3986.
 Offal, burying of, Urie, 252, 286.
 blood and, Cattanaeh, 419, 426.
 burial at abattoirs of, very offensive, Taylor, 1995; see Abattoirs.
 carted away by farmers in Scotland, Robertson, 768.
 Offence from boiling-down establishments, Dickinson, 593, 602.
 from bone-mills at Footscray, Kitchen, 6367; McCarthy, 6439.
 cause of, from bone-mills, Kitchen, 6368; McCarthy, 6487; Binney, 4884; Waddell, 931.
 time it occurs from bone-mills at Footscray, Kitchen, 6370.
 nature of, from bone-mills at Footscray, Kitchen, 6373.
 need be little from tallow factory if tenure was secure, Fitts, 985.
 noxious trades in some countries carried on without, Urie, 347.

Offensive, noxious trades could be made less, Gomm, 6301.
 smell from fellmongeries on Yarra, Husband, 5303; Bage, 5328.
 Saltwater valley, Bennet, 3986-93.
 Saltwater valley, from noxious trades, Reynolds, 3884-3888; Trenchard, 4266.
 Orange, meat trade from, Evans, 3529.
 Outlet, Bondi sewer, Bennett, 2278.
 Botany sewer, Smail, 2992; Bagge, 2432.
 Outlets of drains, Fullerton, 6151-59.
 Paddocks, see Accommodation.
 Palmer, O. F. W., evidence of, 5476-5544.
 Palmer, T. McL., evidence of, 5545-5583.
 Pans for night-soil, Hesse, 3423; Simpson, 5656; Fassie, 3351-57, 3395; Robertson, 5942; Fullerton, 6100.
 Paving of yards, Hesse, 3301-09.
 in Adelaide, Mestayer, 1472, 1476.
 Pedestrians, danger to, by cattle traffic, Urie, 357, 361.
 Penhalluriack, J., evidence of, 6027-6056.
 Pipes, earthen, suitable for main drain, Smith, 1119.
 course of, in Adelaide sewerage, Mestayer, 1446.
 minimum dimensions of, in the streets into which house-pipes discharge, Mestayer, 1445.
 Plans for two kinds of water-closets, Mestayer, 1408.
 Playfair, T., evidence of, 3805-3862.
 Plumbing, defective, in Adelaide, Smith, 1094; Sprod, 1267-1273; Robertson, 1733.
 cause of death of Mr. Howgate, Smith, 1097.
 no grave defects discovered in, Bayer, 1562.
 testing of, Smith, 1098; Sprod, 1276; Bayer, 1564-69.
 work in connecting house-drains with main effectively done, Bayer, 1558.
 Point Cook suggested as site for noxious trades, Gomm, 6303, 6304.
 Pollution of Yarra with fellmongeries, Husband, 5305.
 Saltwater River by abattoirs, Urie, 275; Gomm, 6286; Cattanaeh, 418; Kitchen, 6424; McCarthy, 6465.
 water supply, Simpson, 5618; Davidson, 6511, 6526.
 Population, abattoirs can be near, Miller, 6268.
 great difficulty in estimating Adelaide, Whittell, 1199.
 served by Adelaide Sewage farm, Colebatch, 1871; Mestayer, 1538.
 Botany system, Bennett, 2353.
 Bondi sewer, Bennett, 2335.
 Position of abattoirs, defect in, Cattanaeh, 418.
 Power to summons, Fullerton, 6166.
 Powers as health officer, Dickinson, 603, 620.
 of local boards in regard to nuisances, Cattanaeh, 530.
 Precaution taken to keep water pure in passage from Dividing Range, Davidson, 6582.
 Previous experience of country killing, Palmer, 5377.
 Prevalence of zymotic diseases in Adelaide, Whittell, 1198; Way, 1674; Robertson, 1720.
 in Footscray, McCarthy, 6462-67.
 in Kensington, S.A., Borthwick, 1799.
 Prices country and town killed meet, Playfair, 3823.
 Pridham's stall at abattoirs, Gee, 707-710; Robertson, 788.
 Pritchard, J., evidence of, 4972-5063.
 Private abattoirs, a number of, in Adelaide, Smith, 1127-29.
 enterprise best for up country abattoirs, Bennet, 4047, 4050; Playfair, 3844; Reynolds, 3922; Pritchard, 5052; Woolcock, 4145-51.
 paddocks for cattle, Bennet, 4018-22.
 persons slaughter in Chicago, Urie, 410.
 Producers approve of country killing, Palmer, 5526.
 Proceedings by local board against noxious trades, Gomm, 6286; Bage, 5329.
 Prohasky, W. H., Mayor of Port Melbourne, evidence of, 5411-5431.
 Property, depreciation of, opposite cattle-yards, Cattanaeh, 513.
 through existence of abattoirs, Urie, 261.
 Proposal to cut up alienated lands into allotments, Davidson, 6510.
 Proposed improvements at city abattoirs, Fitzgibbon, 4582, 4591; Mountain, 5147-5173.
 Proportion of stock killed at Glebe Island, Kenway, 2627.
 Prosecutions by inspectors, Jamieson, 5875-91; Fassie, 3290; Fullerton, 6166, 6066; Robertson, 5941.
 Protest against retention of abattoirs, Urie, 252.
 Protection of meat in transit from abattoirs, Elmslie, 2090-2093; Bowser, 3262-3275; Jamieson, 5822-29.
 Provincial boards of health in India, Simpson, 5593, 5600.
 Quantity of dead meat to a truck, Speight, 6253, 6219.
 Question of one central abattoir, Prohasky, 5424-27.
 Read's Report to Local Government Board, Barlow, 10.
 Reasons why abattoirs should be removed, Urie, 252.
 cattle-yards should be removed, Urie, 239, 257, 365.
 Rail to city abattoirs, Robertson, 864, 892.
 Railway facilities, Palmer, 5483, 5502, 5509, 5510, 5540.
 for nightsoil, Baneroft, 2595.
 Rate per head of water consumption, Davidson, 6573.
 of stock trains, Speight, 6200-02-11.
 sewage in Adelaide, Smith, E. T., 1134-36, 1138, 1139.
 Raw hides would be better out of city, Jamieson, 5907, 5908.
 Rawlinson, Sir R., recommends separate system and utilization of sewage on land, Barlow, 10.

- Recommends obtaining a report on German abattoirs, Service, 4198.
- Refrigerating cars, Kenway, 2621 and 2692; Richards, 3699; Speight, 6227-34.
- Refuse at Adelaide burnt in the park lands, Smith, 1148, 1149, 1038.
- carted away into park lands, Sprod, 1324.
- dealt with by residents themselves, Smith, 1056.
- particular form of cart for, Smith, 1148.
- no regular system of scavenging before deep drainage, Smith, 1055.
- regular system for, introduced, 1875, Smith, 1057.
- removed by contract with corporation at Adelaide, Smith, 1147.
- removal of, from city abattoirs, Taylor, 2000-2007.
- treatment of, by destructors, Simpson, 5617.
- Registration of dairies made compulsory, MacLaurin, 2842; Simpson, 5637.
- slaughtermen, Gee, 723.
- Relation of noxious trades to abattoirs, Bennet, 4056-65; Playfair, 3847; Reynolds, 3887, 3929; Waddell, 945.
- Remedy proposed for better regulation of health matters, Keeble, 5757.
- complete removal only, for abattoirs, Dickinson, 634.
- Removal of business, Binney, 4916-23; Fitts, 1025.
- city abattoirs, Jamieson, 5806-08; Urie, 252; Speight, 6237; Fitzgibbon, 4733; Dickenson, 632.
- to higher ground, Fitzgibbon, 4664.
- noxious trades, King, 4510.
- refuse in Adelaide, Smith, 1147-1156.
- Report, Health Officer's, of Adelaide, Smith, 1075.
- meat market, Darling Harbour, Kenway, 2717.
- on American chilled meat by W. C. Coleman, Kenway, 2717.
- Resting cattle before killing, Palmer, 5489; Reynolds, 3914; Bennet, 4040; Dougharty, 4353.
- Reservoirs, closet system has caused a perceptive decrease in the, Bayer, 1584.
- Yan Yean, houses near, Davidson, 6516, 29; drainage towards, Davidson, 6528, see Melbourne Water Supply.
- Retention of old grids useful for admitting air, Bayer, 1556.
- abattoirs, protest against, Urie, 252.
- Return showing area, population, and density of population in each sub-district of Melbourne and suburbs in the years 1877 to 1887, Hayter, 1927.
- the death rate in each sub-district of Melbourne and death-rate, Adelaide, Whittell, 1198.
- suburbs, 1877 to 1887, Hayter, 1927.
- infantile mortality in each sub-district of Melbourne and suburbs, 1887, Hayter, 1930.
- relative mortality of children under the age of five years, in each sub-district of Melbourne and suburbs, 1877 to 1887, Hayter, 1930.
- the mean population, the total mortality, and mortality from certain zymotic diseases in the city of Melbourne during years 1871 to 1875 and 1876 to 1880, Hayter, 1932.
- Revenue from abattoirs, Urie, 383; Fitzgibbon, 4692.
- Reynolds, W., evidence of, 3883-3942.
- Richards, R., evidence of, 3576-3724.
- River pollution committee on, Barlow, 10.
- Saltwater, analysis, Kruse's, of water from, Urie, 276.
- deeply stained with blood, Urie, 274.
- pollution of, Urie, 275; see Pollution.
- smells from, Urie, 283.
- Riverstone Meat Co., advantages of raised floor at their abattoirs, Richards, 3615.
- their system, Richards, 3601-3662.
- chilling no benefit to them, Richards, 3592, 3663.
- cost of chilling, Richards, 3716.
- cost of train, Richards, 3600.
- details of arrangements for slaughtering, Richards, 3603-07.
- distance meat brought, Richards, 3711.
- effect of chilling meat, Richards, 3670.
- inspection, Richards, 3150.
- keeping of chilled meat, Richards, 3657.
- kind of trucks used, Richards, 3657.
- number of carcasses to a truck, Richards, 3600.
- operations of the firm, Richards, 3597.
- results of their trade, Richards, 3596-98.
- treatment of blood, Richards, 3649.
- refuse, Richards, 3617.
- stock, Richards, 3585-89.
- time of slaughtering, Richards, 3590.
- Riverstone system, Trenchard, 4292.
- Road to abattoirs, state of, Robertson, 776.
- very bad in wet weather, Robertson, 781.
- Roberts, W. S. de Lisle, evidence of, 2908-2915.
- description of his process for purifying sewage, &c., Roberts, 2915.
- Robertson, J., officer of city abattoirs, evidence of, 730-876.
- duties to look after cleanliness of abattoirs, 732.
- Robertson, Dr., evidence of, 2778-2819.
- Robertson, inspector, Prahran, evidence of, 5909-6026.
- Roser, W. J., manager desiccating works at Glebe Island, Sydney, evidence of, 2778-2819.
- Sale of hides, &c., Dougharty, 4435-38.
- Saltwater pumped through sewers daily from river at Brisbane, Bancroft, 2588.
- River, blood from abattoirs runs into, Dickinson, 574.
- Kruse's analysis of water from, Urie, 274.
- pollution of, Urie, 275; Gomm, 6286.
- by slaughter-houses, Gomm, 6315, 6318-23, 6350-54; Kitchen, 6424; McCarthy, 6465-80.
- stained with blood, Urie, 274.
- smell from, offensive, Urie, 283.
- Sandy soil for sewage farm, Mestayer, 1545; Smail, 3018-20.
- Sanitary, administration of country districts not satisfactory in N.S.W., MacLaurin, 2849.
- of India, Simpson, 5585-5604.
- should be central, Simpson, 5639.
- condition of Norwood and Kensington, Robertson, 1748-52; Borthwick, 1767, 1823.
- districts, Simpson, 5701.
- Sawmilling difficulty in the Watts River watershed, Davidson, 6538.
- Separate markets unsatisfactory, King, 4523-52.
- system, drainage, Barlow, 10.
- Royal Commission on, Barlow, 10.
- Sir R. Rawlinson recommends, Barlow, 10.
- Service, Hon. J., evidence of, 4174-4201.
- Sewage Board, Sydney, Bennett, 2215-2217.
- certain length of tenure should be given Board, Bennett, 2258.
- Sewage farm, Adelaide, a little smell from, Robertson, 1737.
- area of, Colebatch, 1871.
- a smell at times in main drain leading to, Mestayer, 1499.
- box drains for distributing sewage, Mestayer, 1505.
- Buck's scraper, for levelling land at, Colebatch, 1850; Mestayer, 1527.
- complaints occasionally of smell in main drain to, Mestayer, 1500.
- crops at, Colebatch, 1858.
- description of works in connexion with the filtering of gross sewage at, Mestayer, 1498.
- description of the revolving strainers at, Mestayer, 1503.
- fruit and forage the most reliable to grow, Colebatch, 1862.
- fully one-third of farm useless on account of land not being levelled, Colebatch, 1846.
- nature of the soil at, Mestayer, 1521.
- no smell from ground where solid material spread at, Mestayer, 1501.
- no offence from box drains at, Mestayer, 1507.
- no unstrained sewage used on, Mestayer, 1512.
- one acre per 160 individuals, Colebatch, 1871.
- profit and loss on, Colebatch, 1862.
- strainers at, might be driven by sewage, Mestayer, 1504.
- typhoid not much prevalent near, Whittell, 1595-1604; Sprod, 1365; Way, 1686; Robertson, 1739.
- farm, at Aberdeen, Simpson, 5667; at Paris, 5667-69; at Southampton, 5667.
- farm, Botany, Bennett, 2351-2363; Bagge, 2432-2459; Smail, 2992-3053; Dansey, 3069-3072.
- acreage of, Bagge, 2449.
- character of land, Smail, 3018; Bagge, 2453.
- inlet works at, Bagge, 2432.
- Sewage farm, effect of character of soil on area of, Mestayer, 1544.
- important to have a thoroughly permeable soil for a, Colebatch, 1838.
- land on the shore of Port Phillip suitable for a, Bennett, 2988.
- levels of, important, Mestayer, 1526; Colebatch, 1844.
- number of inhabitants per acre for a, Mestayer, 1538.
- not a nuisance, Simpson, 5667-71.
- the more porous the soil the better for, Mestayer, 1526.
- Sewage of Brisbane, Bancroft, 2523-49.
- effect of river on, Bancroft, 2604-15.
- of Melbourne, Barlow, 1-131; Simpson, 5646-55.
- precipitation of, at Birmingham, Farmer, 181.
- size of farm required for, Barlow, 110.
- soil at Mordialloc favorable for, Barlow, 74-90.
- system for North Shore, Sydney, Bennett, 2971.
- treatment of, at Birmingham, Farmer, 179-184.
- Sewerage Act, Sydney, legal difficulties met with in carrying out work under the, Bennett, 2234.
- Board, Sydney, Bennett, 2240-60.
- scheme, Sydney, Bennett, 2201-2366; Bagge, 2367, 2460; Smail, 2989, 3053.
- works, Sydney, constructed at cost of State, Bennett, 2230.
- Sewer, course of the Bondi, Bennett, 2265.
- description of the outlet channel at Bondi, Bennett, 2278.
- description of the general form and construction of main, Bennett, 2292.
- no trouble in maintenance of Bondi, Bagge, 2376.
- trouble in working of Bondi, Bagge, 2374.
- ventilation of Bondi, Bagge, 2378.
- southern, Bennett, 2348.

Sewers at Adelaide, are far better ventilated than previously, Mestayer, 1464.

a systematic general test should be applied to, Bayer, 1565.

cast-iron, manufactured in Adelaide, Mestayer, 1495.

have caused no serious inconvenience, Whittell, 1595.

man-hole for inspection of, Smith, 1141.

main, construction of, Bayer, 1553; Mestayer, 1496; Barlow, 58.

no complaints of smell since ventilation of, Sprod, 1255.

of cast-iron pipe when near surface, Mestayer, 1494.

obstruction of sewage water through sinking of, Sprod, 1259.

roots of trees through joints, Sprod, 1260.

rags and other improper substances cause stoppages, Sprod, 1265; Smith, E. T., 1121.

Silting of, Smith, E. T., 1114; Sprod, 1256.

Smoke test applied before connexions are covered, Bayer, 1568.

trouble in ventilation of, Smith, 1143.

Sewers at Brisbane, salt water pumped from river daily through, Bancroft, 2588.

fall in, Mestayer, 1396, 1450; Bennett, 2267, 2358; Barlow, 111.

for Manly, Bennett, 2960-2970; Griffin, 2917-2933.

rate for, in Adelaide, Smith, 1134.

Sir R. Rawlinson's evidence, before Royal Commission, Barlow, 10.

ventilation of, at Brisbane, Bancroft, 2548.

Adelaide, Whittell, 1240; Mestayer, 1408-1427, 1455-1466; Worsnop, 1042; Smith, 1143.

Sydney, Bennett, 2316-2319; Bagge, 2377-2391; Barlow, 128 131.

Sheep killing, Mr. Bennet's place at abattoirs, Gee, 699-786.

Mr. Pridhan's place at abattoirs, Gee, 707-710.

Siding to yards, Fitzgibbon, 4599-4603, 4607-8.

at Newmarket, Speight, 6209-6217.

Silt-pit, Moonee Ponds, under control of Lands Department, Cattanaich, 464.

state of, Cattanaich, 465.

Silting of sewers, Smith, E. T., 1114; Sprod, 1256.

Simpson, Dr., evidence of, 5584-5741.

Site of abattoirs altogether unsuitable, Urie, 259; Reynolds, 3866-74; Pritchard, 4977-82; Taylor, 1955.

suitable, Benjamin, 4561, 4563-66; Jamieson, 5771-75; Bennet, 3946-48.

sewage farm, Barlow, 10.

Sites, available for abattoirs, Dickinson, 632; Speight, 6237-39.

difficulty about getting abattoirs, Urie, 397; King, 4520. for noxious trades, Gomm, 6303.

proposed at Keilor Plains, Cook's Point, and Bulla, Urie, 375-377; Echuca, Service, 4198.

Slaughter-houses licensed in Adelaide, Smith, 1162.

no objection in Adelaide to private, Smith, 1157.

should be out of the city, Sprod, 1304.

washed with lime once a week at abattoirs, Robertson, 738.

Slaughtering on pasture grounds, Trenchard, 4203-9, 4323; see Country killing.

in Chicago by private persons, Urie, 410.

on premises, Eassie, 3296, 3297.

Slaughtermen, not sufficient power over, Gee, 724.

should be licensed, Gee, 726.

Smail, J. M., evidence of, 2989-3053.

Smell from abattoirs not noticeable where houses are, Jamieson, 5802.

from river offensive, Urie, 283.

defective management of boiling-down works, Waddell, 930.

effect on health of, Jamieson, 5798-5812.

fellmongery on Yarra, Husband, 5303; Bage, 5328.

rotten meat at Footscray, McCarthy, 6487-94-97.

generally in the streets from deep drainage works, Sprod, 1254.

intense from noxious trades, Dickinson, 602; Kitchen, 6372; Buchan, 6641.

noxious trades not directly injurious to health, Dickinson, 596.

occasionally from deep drainage works, Sprod, 1253.

Smelting works at Footscray, McCarthy, 6447-52.

Smith, Sir E. T., evidence of, 1043-1182.

Smith, G. F., evidence of, 5277-5298.

Smith, T., Mayor of South Melbourne, evidence of 4754-4829.

Smoke, test for, connexions with sewers, Bayer, 1568; Sprod, 1269, 1276; Smith, 1098.

Soakage of sewage into ground, Simpson, 5646, 5647, 5653.

Soil, damp, Simpson, 5646; Robertson, 6010.

impregnated with animal matter, Robertson, 840.

nature of, at Adelaide Sewage farm, Colebatch, 1839-43. at Botany Sewage farm, Bagge, 2453; Smail, 3018, 3019.

smell from, at abattoirs, Urie, 293.

Source of meat supply, Bennet, 4001-4013; Reynolds, 3896-3900; Trenchard, 4210 4220.

raw material, Binney, 4864-68.

Southern abattoirs, Clarke, 5473; Miles, 4846-51, 4855-57; Penhalluriack, 6044-6046.

Southern sewerage system for Sydney, Bennett, 2348.

Special legislation required for removal of abattoirs, Gomm, 6316.

train for carrying meat, Richards, 3590.

stock, Dougharty, 4351.

Speed of stock trains, Speight, 6200-2, 6211.

of meat trains, Speight, 6249-51.

Speight, R., Commissioner of Railways, evidence of, 6182-6263.

Stables, Eassie, 3370, 3371.

Stability of cement grouting, Grimes, 4935-38.

State constructed sewerage works of Sydney, Bennett, 2230.

should erect abattoirs, Urie, 382.

of road leading to city abattoirs, Robertson, 776-781.

Statistics vital, of Melbourne and suburbs, year 1887, Hayter, 1950.

Steam, disposal of, from boiling-down works, Waddell, 892.

no smell from if conducted properly, Waddell, 895.

Stirling, Government Inspector, attends at abattoirs, Robertson, 796.

Stock affected by bad drainage, Pritchard, 4985-91.

number slaughtered, Gee, J., 643.

number yarded at Flemington, Trenchard, 4203.

taken to abattoirs by rail, Kenway, 2666.

treatment of, at Riverstone, Richards, 3583-89; at Orange, Evans, 3563-75.

trains, Speight, 6200; see also under Trucking, Abattoirs, Accommodation-paddocks, Cattle.

Strainers at Adelaide Sewage farm, Mestayer, 1498, 1503, 1504.

at Botany, Bagge, 2434-36; Smail, 2992.

Street drainage, Fullerton, 6137-44; Barlow, 12; Simpson, 5646; Robertson, 5972-6004.

sweeping in Adelaide, Sprod, 1332.

ventilators, a nuisance, Mestayer, 1455; Whittell, 1238.

Sub-soil, of Adelaide, character of, Whittell, 1231-1234.

contamination of, Barlow, 121-123; Simpson, 5646-55.

of Melbourne, condition of, Fullerton, 6161.

of Prahran, Robertson, 6008.

no examination of in Adelaide, Smith, 1062-63.

the old system in Adelaide caused contamination of, Smith, 1054; Way, 1645; Whittell, 1207-1220.

Suburban abattoirs, Jamieson, 5811-15, 5835-41; Bennet, 4066; Penhalluriack, 6049-55.

should be abolished, Woolcock, 4157-58.

retained, Pritchard, 5014-5021; Dougharty, 4440-50.

Supervision of butchers' stalls at abattoirs, Bowser, 3276-3280.

country-killing establishments, Playfair, 3843-45.

private abattoirs, Bowser, 3262.

noxious trades, Gomm, 6285.

Sydney, Act for the opening up of streets in, Bagge, 2392.

acreage of Sewage farm at, Bagge, 2449.

Board of Health has no power over the sewerage or drainage, MacLaurin, 2869.

Board of Water Supply and Sewerage, Bennett, 2244-2261.

description of outlet channel, Bondi sewer, Bennett, 2278.

general form and construction of main sewer, Bennett, 2292.

the inlet works of the Southern sewage system, Bagge, 2432; Bennett, 2363.

character of the land at Sewage farm at, Smail, 3013-3053; Bagge, 2453.

constitution of the Board of Water Supply and Sewerage of, Bennett, 2244.

cost of sewage works, Bennett, 2366.

cost of sewage system for North Shore, Bennett, 2977.

course of the Bondi sewer, Bennett, 2265.

course pursued in connecting houses with new drainage, Jones, 3139-3152.

general course of the southern sewer, Bennett, 2348-2351.

health authorities, no control over sale of unwholesome meat, MacLaurin, 2866.

large mass of diluted sewage goes into the harbour, Bagge, 2427.

legal difficulties met with in carrying out works under the Sewerage Act of, Bennett, 2234-2243.

no trouble in maintenance of sewers in, Bagge, 2376.

registration of dairies made compulsory in, MacLaurin, 2842.

sewage scheme, Bennett, 2201-2366; Bagge, 2367-2460; Smail, 2989-3053.

Sewage Board, Bennett, 2215-21.

trouble in making the Bondi sewer at, Bagge, 2374.

ventilation of sewers in, Bagge, 2378; Bennett, 2316-2319.

Meat Preserving Company, business of, Gee, A., 2463.

desiccators at, Gee, A., 2464-2467.

drainage at, Gee, 2503.

method of slaughtering, Gee, 2497-2501.

method of cleaning floors, Gee, 2499-2502.

treatment of blood and offal, Gee, 2464-2496.

water supply, MacLaurin, 2886-97; Tillett, 3727-3805.

Tait, Dr. L., on water carriage system, Barlow, 46.

Tallow Factory and Glue and Manure Works, all drainage from, into a receiver, Fitts, 1006.

Tallow Factory, &c., continued—

- conduct of business, Fitts, 954.
- could be guaranteed to be inoffensive if secure tenure, Fitts, 1033.
- details of the work at, Fitts, 962-983.
- drainage of, Fitts, 984.
- everything sent out is manufactured at, Fitts, 996.
- inspected by council sometimes, Fitts, 992.
- material for, from Melbourne and suburbs, Fitts, 1026.
- no offence if conducted with proper appliances, Fitts, 961, 985.
- notice from Central Board of Health to improve drainage of, Fitts, 1015.
- yearly licence for, from Flemington Council, Fitts, 997.
- Tanneries desire to be removed from list of noxious trades, Donovan, 5067.
- offence from, Donovan, 5076; Dunn, 5116-19; Holton, 5094; Kennon, 5100-5111.
- Taylor, J., inspector under Central Board of Health, evidence of, 1951-2065.
- Tenants, no objection by, to desiccating works, Farmer, 160.
- nearest to abattoirs, Urie, 319; Robertson, 852.
- Tenure of land of abattoirs, Fitzgibbon, 4578-80.
- Port Melbourne abattoirs, Prohasky, 5421.
- members of Sydney Sewerage Board, Bennett, 2258.
- Tillett, G. A., evidence of, 3725-3805.
- Timber must come down Watts valley to Melbourne, Davidson, 6549.
- effect of cutting, on rainfall, Davidson, 6564-67.
- Time cattle remain in accommodation-paddocks, Cattanaach, 540.
- cattle kept at abattoirs, Taylor, 1964; Gee, 651; Reynolds, 3908.
- stock kept before killing, Pritchard, 4992-5001; Bennet, 4018, 4099.
- taken in making improvements at city abattoirs, Fitzgibbon, 4663.
- Tips, Eassie, 3367.
- Traffic in streets of cattle, Dickinson, 628-630.
- Treatment and removal of sewage, Hesse, 3428-3474.
- blood and offal at abattoirs, Taylor, 1994; Jamieson, 5780-5783-5847; Bennet, 3977-3984; Reynolds, 3878; Robertson, 817, 830, 832-840.
- blood at abattoirs, Robertson, 817-830.
- cattle at abattoirs, Reynolds, 3934-35; Robertson, 798-816, 831.
- cattle, after sale, Trenchard, 4231-4250.
- fleshings, Donovan, 5081-84.
- night-soil, Bancroft, 2525-42, 2590-2601; Eassie, 3351-59, 3395-3408; Robertson, 5942-5970; Fullerton, 6100-6136.
- refuse at abattoirs, Gee, 693-696; Robertson, 773, 774, 817-829.
- refuse at Calcutta, Simpson, 5617.
- skins, Taylor, 2055, 2065.
- Trenchard, Edward, evidence of, 4202-4348.
- Trouble with fellmongery and woolscouring drainage, Mestayer, 1482.
- Truck, number of cattle carried in, compared with number of carcasses, Playfair, 3819; Reynolds, 3938; Trenchard, 4309, Palmer, 5510; Speight, 6219.
- number of carcasses in, Richards, 3601.
- Trucking arrangements, Trenchard, 4221-27; Palmer, 5526; Bennet, T. K., 4023-32; Dougharty, 4350, 4351; Evans, 3574; Playfair, 3812, 3813; Reynolds, 3909-3912.
- Two houses in vicinity of reservoir, Davidson, 6516.
- their distance from reservoir, Davidson, 6519.
- Typhoid fever at sewage farm, Whittell, 1595-1604; Way, 1686; Robertson, 1739; Sprod, 1365.
- imported from Teetulpa and Broken Hill, Smith, 1086; Whittell, 1207; Sprod, 1351-52.
- excreta, disinfection of, Whittell, 1604; Sprod, 1370-75, 1380-87; Fullerton, 6079; Robertson, 5936.
- excreta to sewage farm, Sprod, 1360; Whittell, 1603; Way, 1608.
- mortality from, Hayter, 1929, 1935.
- no record kept of, Smith, 1088.

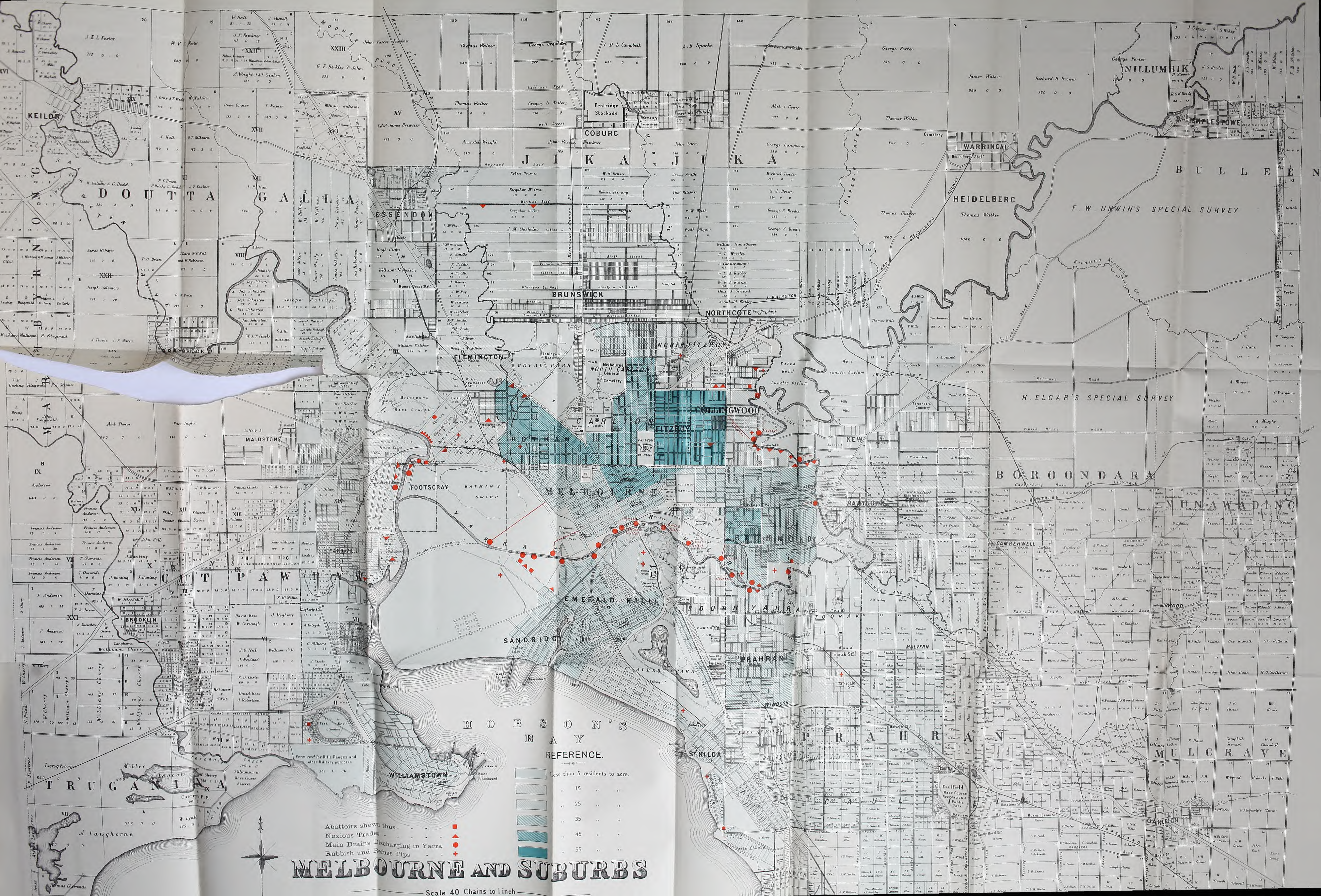
Typhoid Fever, continued—

- proceedings in case of, Eassie, 3372-3387.
- Unwholesome food, Robertson, 5918, 5919, 5932-35.
- Urie, J., Mayor of Flemington and Kensington, evidence of, 243-410.
- Utilization of site of abattoirs, Dickinson, 627, 632; Cattanaach, 514, 523.
- Value of property, effect of abattoirs on, Urie, 261.
- Valuation of alienated lands, Davidson, 6532-33.
- Ventilation and accommodation at abattoirs, Taylor, 2012, 1983.
- of abattoirs, Kenway, 2621; Richards, 3615; Woolcock, 4111; Playfair, 3850; Reynolds, 3874, 3875; Bennet, 3972.
- of sewers, Barlow, 128-131. Brisbane, Bancroft, 2548. Adelaide, Whittell, 1240; Mestayer, 1408-1427, 1453-1466; Worsnop, 1042; Smith, 1143. Sydney, Bennett, 2316-2319; Bagge, 2377-2391.
- Ventilators in streets a nuisance, Mestayer, 1455.
- Voluntary contributions towards public works, Griffin, 2935-38.
- Vital statistics of Melbourne and suburbs, 1887, Hayter, 1950.
- Waddell, R. W., evidence of, 877-950.
- Walker's Candle and Soap Factory a nuisance, Buchan, 6638-45.
- action taken thereto, 6646-67.
- Water, analysis of drinking, should be made regularly, Simpson, 5619-25.
- analysis of, from Saltwater River, Urie, 276.
- high consumption of, owing to manufactories, Mestayer, 1470.
- under floors and in subsoil, Robertson, 5998-6000, 6009-6011.
- sometimes analyzed, Davidson, 6590.
- supplied to Adelaide, analyses of, Whittell, 1618-23; very impure, Sprod, 1342.
- Water carriage system, advantage of, Barlow, 12.
- best for any town, Bayer, 1587.
- calculation of expense of, Barlow, 49-54.
- effect of, on water supply, Davidson, 6568.
- should be adopted, Barlow, 10, 11, 12; Simpson, 5672.
- Tait, Dr. L., on, Barlow, 46.
- Water-closets, cost of alteration from present system to, Barlow, 34-40.
- connected with old sewers on payment of a fee in Adelaide, Smith, 1066, 1133.
- description of connexion with main sewers, Mestayer, 1413.
- description of ventilation for, Mestayer, 1415, 1434.
- plans for, Mestayer, 1408-1415.
- Water supply, Brisbane, Bancroft, 2550-2560.
- Calcutta, Simpson, 5626-34.
- Sydney, McLaurin, 2886-2897; Tillett, 3727-3805.
- See also Melbourne Water supply.
- Watts River scheme of water supply, Davidson, 6538, 6563, 6570, 6613, 6621.
- Way, Dr. E. W., evidence of, 1624-1712.
- Well, blood run into, from abattoirs, Dickinson, 574.
- Where city abattoirs should be erected, Urie, 375-379.
- Whittell, Dr. H. T., President Local Board of Health of South Australia, evidence, 1183-1244, 1595-1623.
- Williamstown could be supplied from central abattoirs, Craig, 5266, 5267.
- Willing, J. R., evidence of, 5363-5410.
- Woolcock, J., evidence of, 4103-4173.
- Worsnop, T., town clerk of Adelaide, evidence of, 1039-1042.
- Yan Yean, pollution of, Simpson, 5618; Davidson, 6501-6529.
- Zymotic diseases, imported to Adelaide, Way, 1680.
- in Footscray in comparison with other towns, McCarthy, 6486.
- less prevalent after completion of deep drainage, Robertson, 1720.
- mortality from, Whittell, 1198.
- Norwood, Whittell, 1623.
- prevalence of, in Footscray, McCarthy, 6462-64.
- Kensington and Norwood, S.A., Borthwick, 1799.
- Unley, Whittell, 1623.

INDEX TO APPENDICES.

- Abattoirs, Berlin, description of, T, p. 363.
city, Q, p. 357.
by-laws regulating, N, p. 356.
conditions of permissive occupancy of reserve at, O,
pp. 356 and 357.
description of, Q, p. 357.
estimate of cost of machines for treating refuse at, R,
p. 359.
grant of land for, M, p. 355.
Philadelphia, description of, U, p. 364.
suburban, description of, S, p. 359.
treatment of waste liquor from, Z, p. 368.
- Adelaide sewerage, gradients of, E, p. 349.
- American chilled meat, report of U. S. Commissioner of Agriculture on, A1, p. 368.
- Analysis of effluent from Adelaide Sewage Farm, D, p. 348.
- Anderson, W. and Co., slaughter-yards, description of, S, p. 363.
- Ballard, D., report on effluvium nuisances, G, p. 375.
- Barlow, Crawford, information regarding sewage of cities, compiled by, C, p. 346.
- Bayles, J. C., letter from, X, p. 367.
- Bennett, W. C., memo. from, *re* Sydney Water and Sewage Board, G, p. 349.
- Berlin abattoirs, description of, T, p. 363.
Board of Health, Philadelphia, rules of, V, p. 365.
of Supervisors of Public Health, San Francisco, rules of, W, p. 366.
- Sydney Water and Sewerage, value of property represented by members elected by municipalities, G, p. 349.
- Brundell's, J., abattoirs, description of, p. 361.
- Butler, Geo. J., report to Central Board of Health *re* deposit of refuse in South Melbourne, K, p. 354.
- Cattle injured in trucks, return of, F, p. 374.
- Chilled meat trade, report on, A1, p. 368.
- Chilling meat, rules for, E1, p. 374.
- Christchurch, mode of dealing with refuse in, I, p. 351.
sewerage of, I, p. 351.
report on, by Mr. E. Cuthbert, H, p. 352.
- Collingwood abattoirs, description of, S, p. 362.
- Connections of houses with sewers, letter from J. Trevor Jones, *re*, H, p. 250.
- Cost of connecting water closets in Adelaide, F, p. 349.
- Cost of chilling meat, E, p. 374.
- Cuthbert, Edwin, report on Christchurch sewerage, by, I, p. 352.
- Darling Harbor meat market, A1, p. 371.
- Dead meat trade, extracts from pamphlet on, B1, p. 372.
letter from F. G. Docker, on, D1, p. 373.
from W. H. Palmer, on, D1, p. 373.
- Description of city abattoirs, Q, p. 357.
suburban abattoirs, S, p. 359.
- Dundas Bros., abattoirs, description of, p. 360.
- Dunedin, drainage of, J, p. 353.
treatment of refuse at, J, p. 353.
- Effluvium nuisances, report on, by Dr. Ballard, G1, p. 375.
- Essendon slaughter-yards, description of, p. 363.
- Estimate of cost of machines for treatment of refuse at city abattoirs, R, p. 359.
- Footscray abattoirs, description of, S, p. 360.
- Grant of land as site for abattoirs at Doutta Galla, M, p. 355.
- Health Department, New York, letter from President of, X, p. 367.
- Information regarding sewage of cities, compiled by Mr. Crawford Barlow, C, p. 346.
- Jones, J. Trevor, letter from, H, p. 350.
- Kenway, Arthur G., report by, on treatment of waste liquors from abattoirs, Z, p. 368.
- Letter from J. C. Bayles, President Health Department, New York, *re* regulation of noxious trades, X, p. 367.
- J. Trevor Jones, *re* connections with sewers in Sydney, H, p. 350.
- W. G. Loch, *re* rates for chilling meat, E1, p. 374.
- S. H. Mirams, *re* drainage, &c., of Dunedin, J, p. 353.
- Letter from E. B. Pond, mayor of San Francisco, *re* regulation of noxious trades, Y, p. 368.
- C. Walkden, *re* treatment of refuse in Christchurch, I, p. 355.
- Thomas Worsnop, Town Clerk of Adelaide, *re* cost of connecting water closets, F, p. 349.
- Loch, W. G., manager New South Wales Fresh Food and Ice Company, Sydney, letter from, *re* rates for chilling meat, E1, p. 374.
- Meat market, Darling Harbour, report on, A1, p. 371.
- Meat trade, extracts from pamphlet on, D1, p. 372.
letter from F. G. Docker, *re*, C1, p. 373.
W. H. Palmer, *re*, D1, p. 373.
- Mestayer, R. L., memo. from, *re* gradients of sewers, E, p. 349.
- Mirams, S. H., information concerning sanitary arrangements of Dunedin, J, p. 353.
- Municipalities, table of replies from, A, p. 335.
- New York, noxious trades in, letter *re*, X, p. 367.
- Night-soil, methods of collecting in Melbourne, report by Constable Wardley, L, p. 355.
in Dunedin, J, p. 353.
- Noxious trades, schedule of, B, p. 339.
- Orders of Board of Supervisors relating to public health, San Francisco, concerning noxious trades, W, p. 366.
- Philadelphia abattoirs, U, p. 364.
Board of Health, rules of, V, p. 365.
- Pond, E. B., mayor of San Francisco, letter from, Y, p. 368.
- Port Melbourne abattoirs, description of, S, p. 359.
- Rates for chilling meat, E1, p. 374.
- Refuse, treatment of, in Dunedin, J, p. 353.
used to make streets, report by Mr. Butler, K, p. 354.
- Rennie, E. H., analysis of effluent Adelaide Sewage Farm, D, p. 348.
- Replies to questions from municipalities, A, p. 335.
- Reports, American chilled meat, A1, p. 368.
Ballard, on effluvium nuisances, G, p. 375.
Board of Health, Philadelphia, 1875, U, p. 364.
Butler, *re* refuse, K, p. 354.
Cuthbert, *re* sewerage of Christchurch, I, p. 351.
Kenway, on treatment of waste liquors from abattoirs, Z, p. 368.
Meat market, Darling Harbour, A1, p. 371.
Mirams, *re* sanitation in Dunedin, J, p. 353.
Rennie, on effluent from Adelaide Sewage Farm, D, p. 348.
Wardley, on methods of collecting night-soil in Melbourne and suburbs, L, p. 355.
- Return of sheep and cattle arriving dead or injured in trucks on Victorian railways, F1, p. 374.
- Richmond abattoirs, description of, S, p. 360.
- Rules of Board of Health, Philadelphia, as to slaughter-houses and bone-boiling establishments, V, p. 365.
- San Francisco, rules of Board of Supervisors at, W, p. 366.
- Schedule of noxious trades, B, p. 339.
- Sewage Farm, analysis of effluent from, D, p. 348.
of cities, information regarding, C, p. 346.
- Sewerage, Adelaide, gradients of, E, p. 349.
Christchurch, I, p. 351.
Dunedin, J, p. 353.
Sydney, letter from Mr. J. Trevor Jones, *re* connections, H, p. 350.
- South Melbourne abattoirs, description of, S, p. 359.
- St. Kilda abattoirs, S, p. 362.
- Sydney Water and Sewage Board, memo. *re* value of property represented by members of, elected by municipalities, G, p. 349.
- Tabulated statement of replies forwarded by municipalities to circular letter from the Commission, A, p. 335.
- Value of property represented by elected members of Sydney Sewage Board, G, p. 349.
- Walkden, C., letter from, I, p. 351.
- Wardley, Constable, report of, on collection of night-soil, L, p. 355.
- Waste liquors from abattoirs, treatment of, Z, p. 368.
- Williamstown abattoirs, description of, S, p. 361.
- Worsnop, T., letter from, *re* cost of connecting water closets F, p. 349.





CITY OF MELBOURNE

CATTLE - YARDS & ABATTOIRS

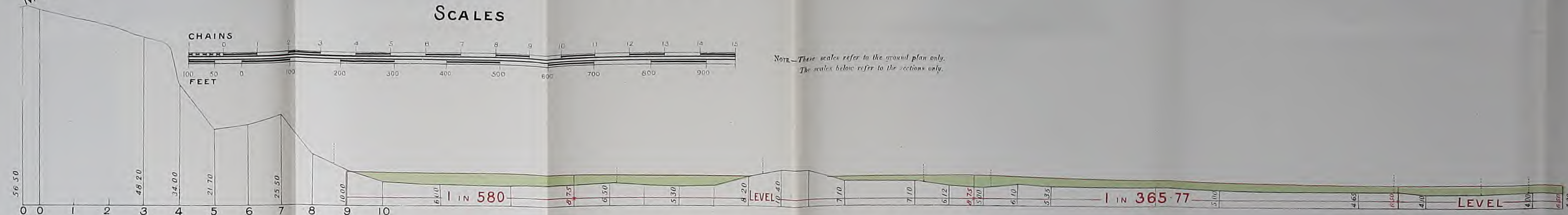
McAULEY R^d

SCALES

CHAINS

FEET

Note - These scales refer to the ground plan only.
The scales below refer to the sections only.



LONGITUDINAL SECTION FROM A TO B ON PLAN

ROAD

McAULEY R^d

K

McAULEY R^d

SMITHFIELD

ROAD



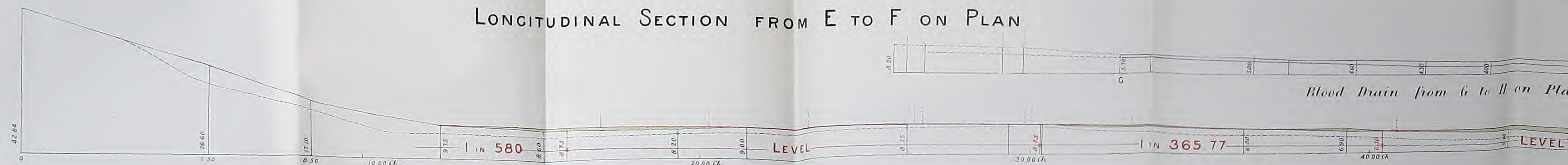
LONGITUDINAL SECTION FROM C TO D ON PLAN

Note - Present Drain shown in Blue Line.
Proposed Drain shown in Dotted Blue Line.



LONGITUDINAL SECTION FROM E TO F ON PLAN

Blood Drain from G to H on Plan



LONGITUDINAL SECTION FROM K TO L ON PLAN

NOTE - Dotted Lines show level of paddocks at side of road

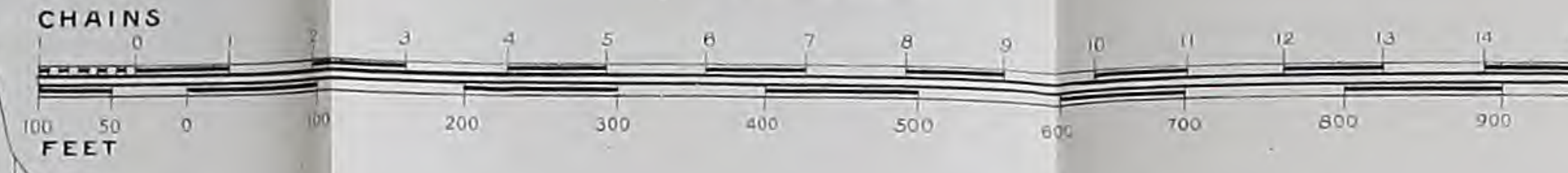
Scales for Sections { Horizontal 2 Chains = 1 Inch
Vertical 20 Feet = 1 Inch



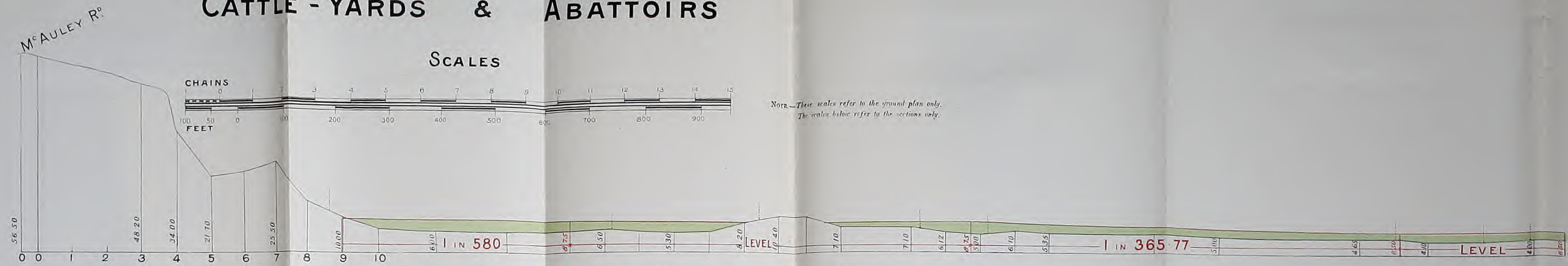
CITY OF MELBOURNE

CATTLE - YARDS & ABATTOIRS

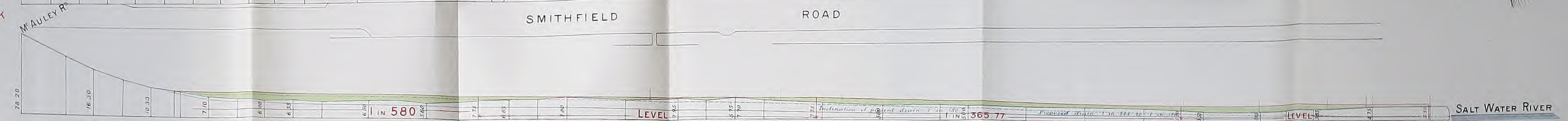
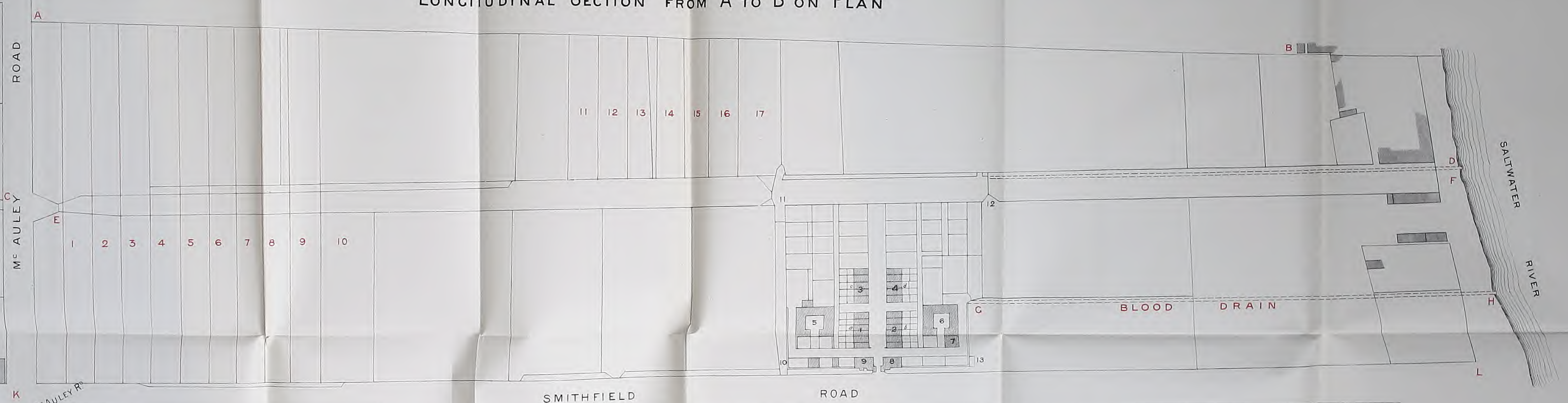
SCALES



Note - These scales refer to the ground plan only.
The scales below refer to the sections only.



LONGITUDINAL SECTION FROM A TO B ON PLAN

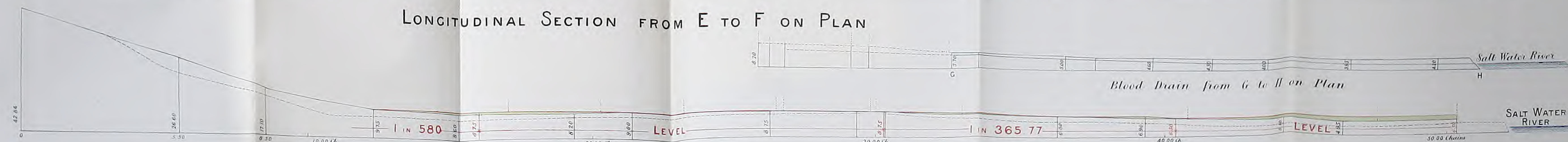


LONGITUDINAL SECTION FROM C TO D ON PLAN

Note = Present Drain shown in Blue Line
Proposed Drain shown in Dotted Blue Line.



LONGITUDINAL SECTION FROM E TO F ON PLAN



LONGITUDINAL SECTION FROM K TO L ON PLAN

NOTE - DOTTED LINES SHOW LEVEL OF PADDOCKS AT
SIDE OF ROAD

Scales for Sections { Horizontal 2 Chains = 1 Inch
Vertical 20 Feet = do

RICHMOND ABATTOIRS

Calle Yard

Sheep Yards

Cattle Yards

Cattle Yard

Water

HAWTHORN RAILWAY

LOCALITY PLAN

6 Chains to 1 Inch

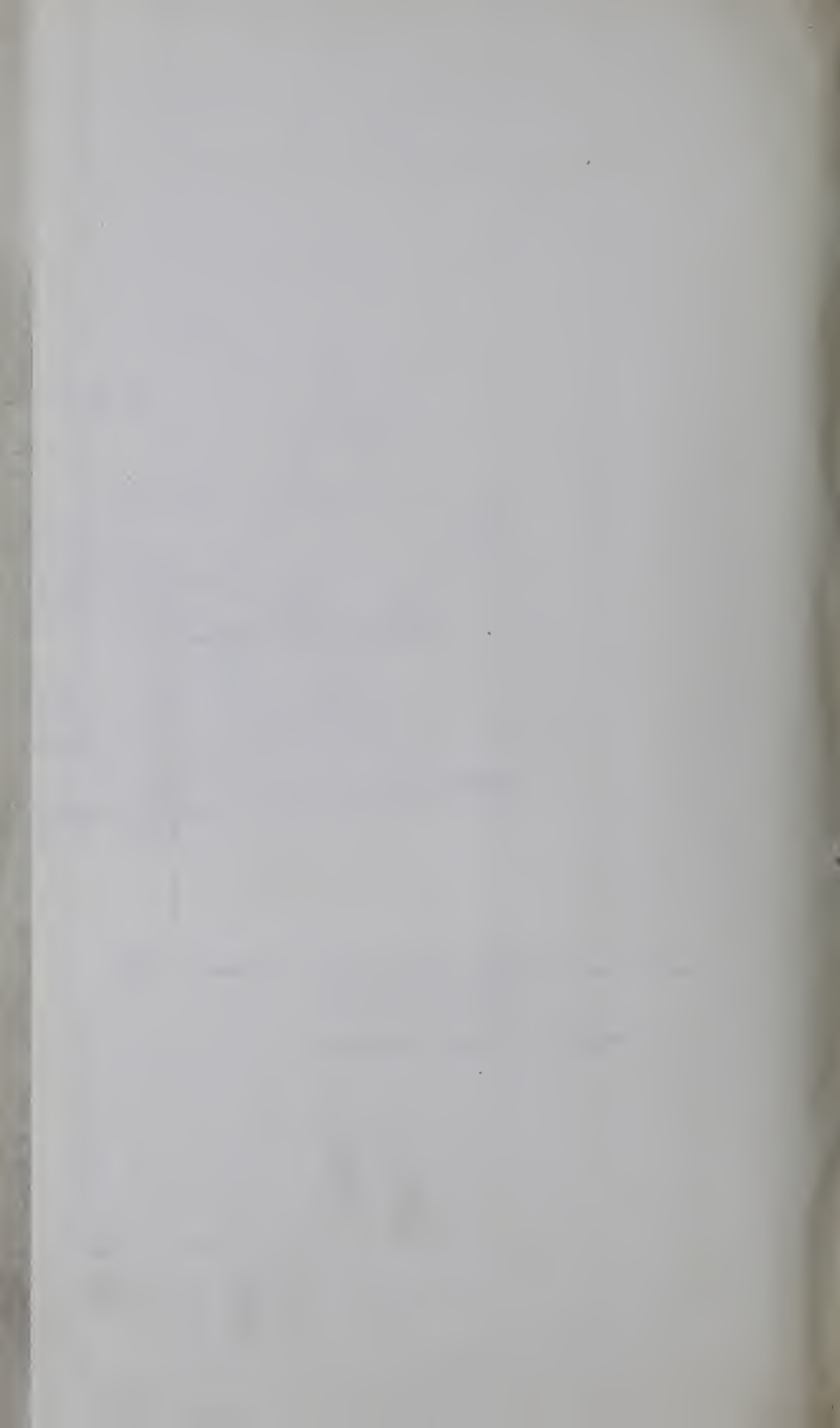
TURNLEY ST

BERLIN STREET

RIVER YARRA

Scale, 24 Feet to 1 Inch



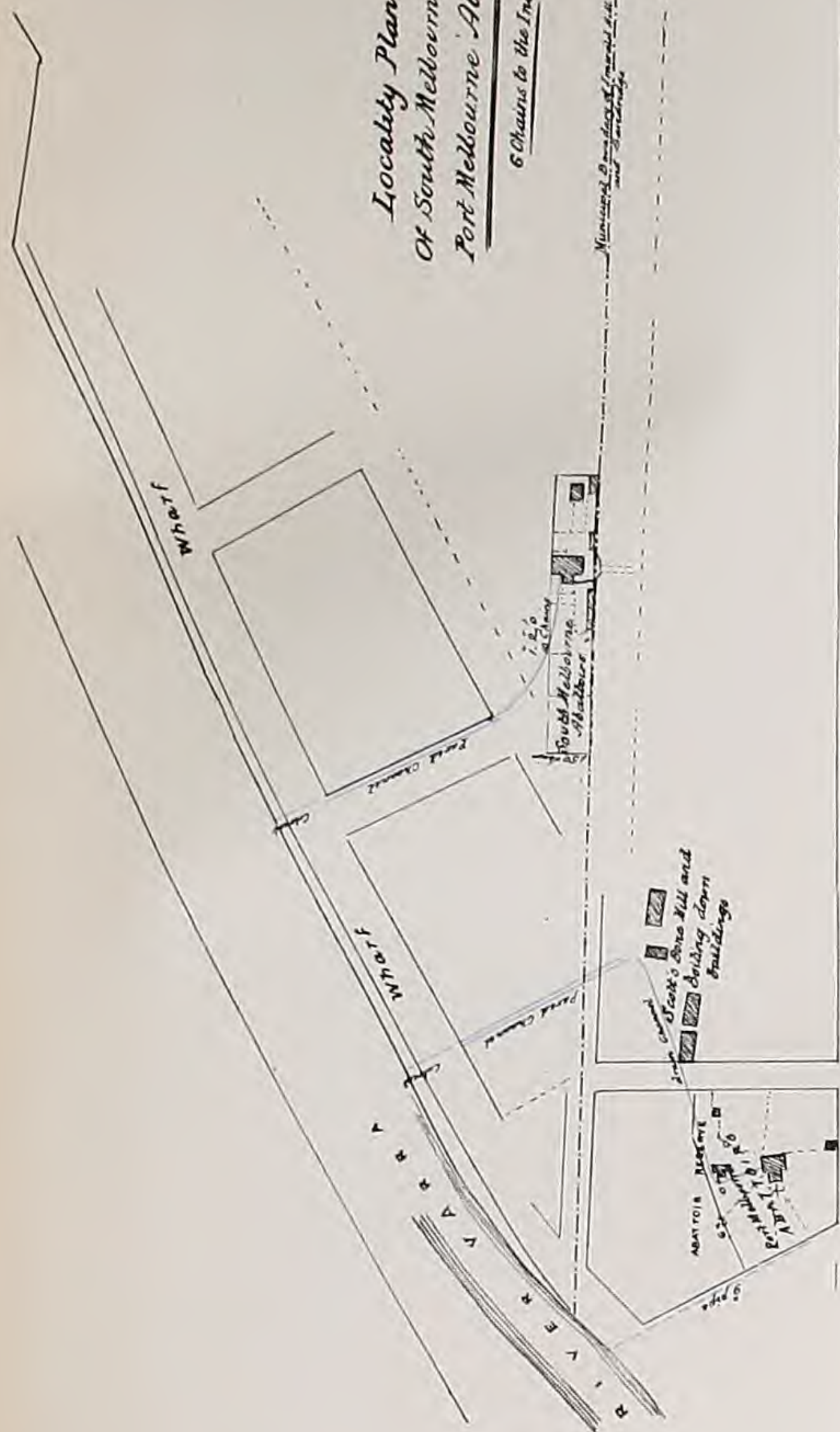


Locality Plan Of South Melbourne and Port Melbourne Abattoirs

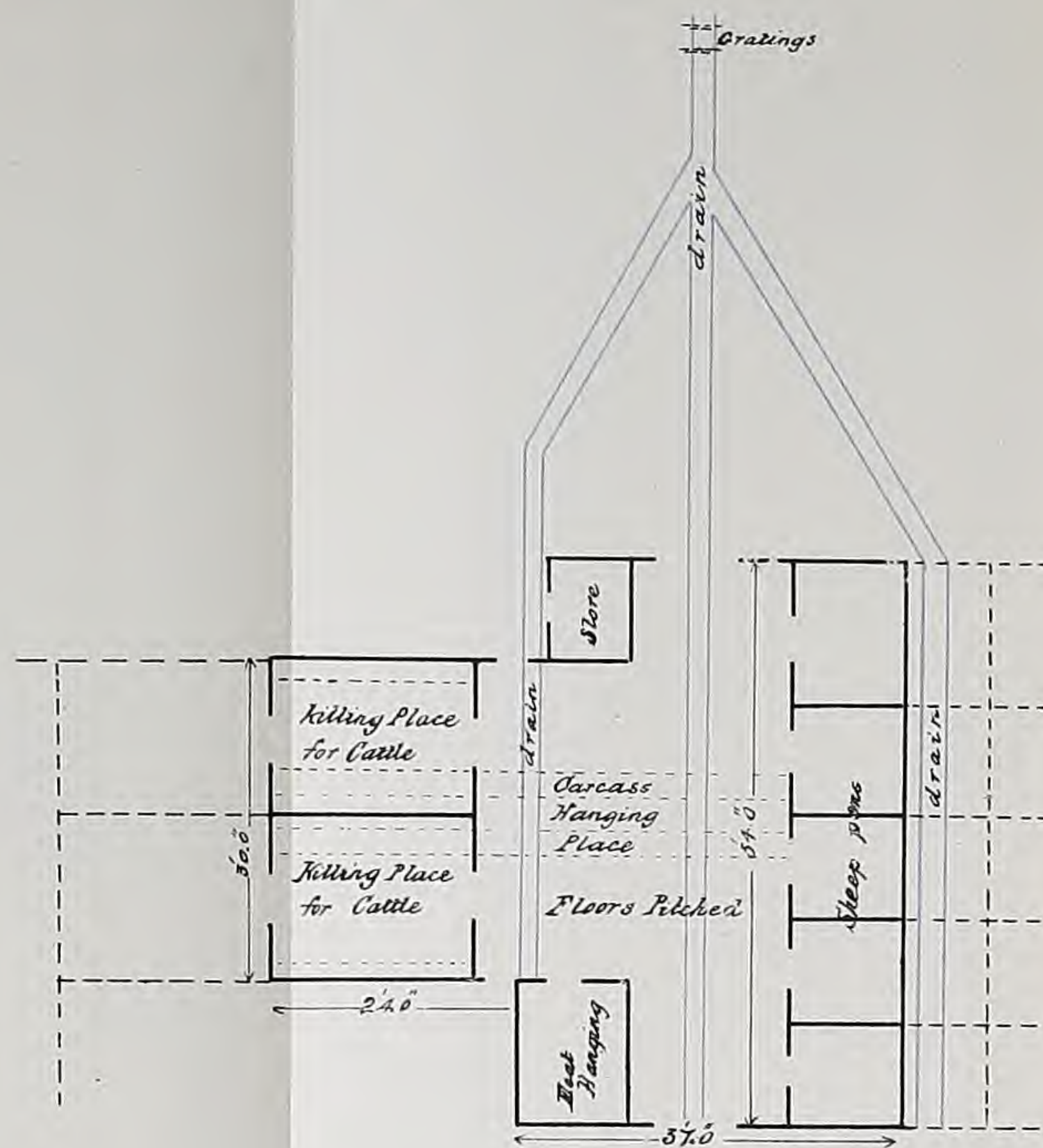
6 Chains to the Inch

Minimum of 200 feet from all
roads and buildings

INCHES STREET

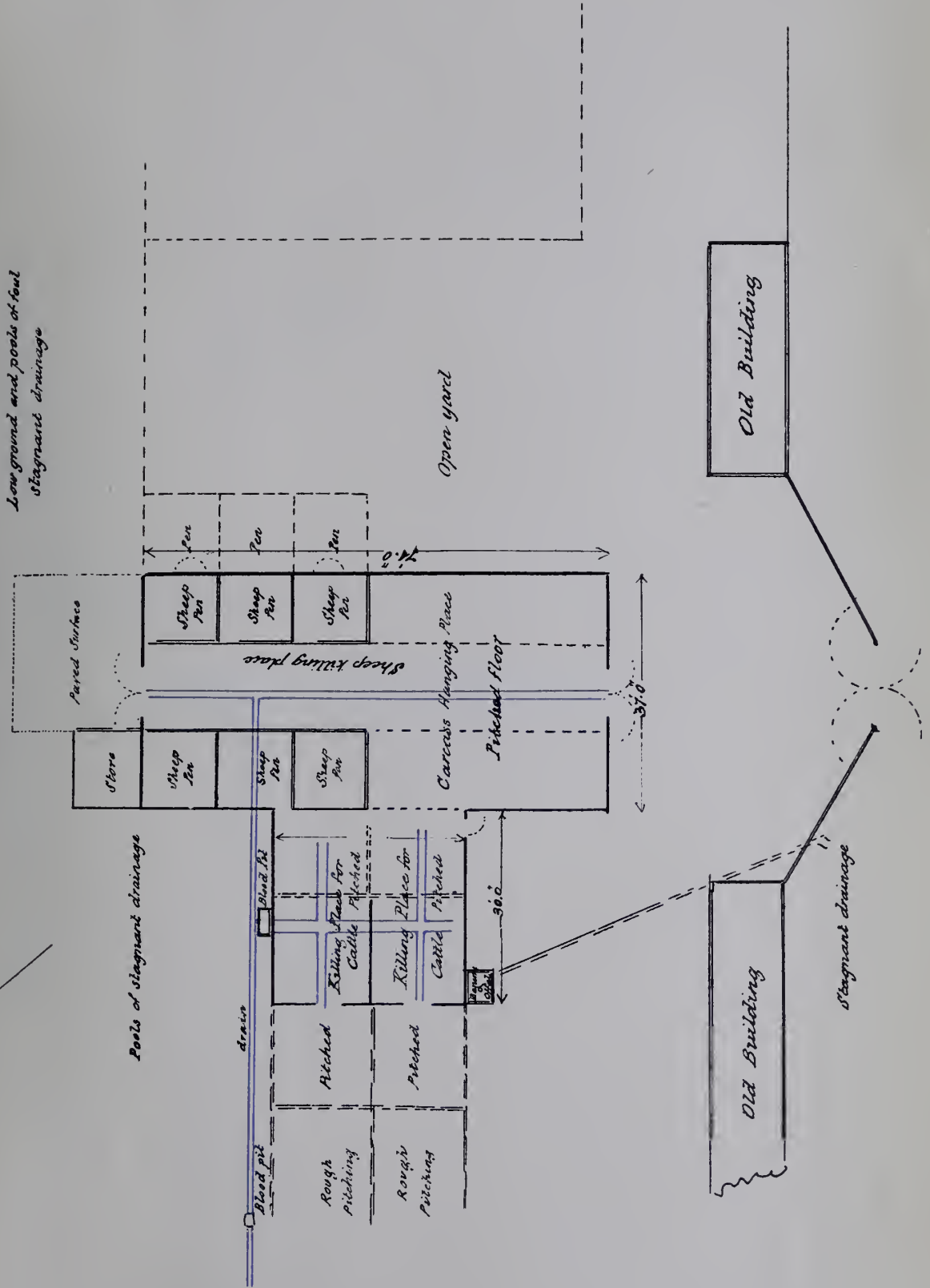


Port Melbourne Abattoirs



16 Feet to 1 Inch

Low ground and pools of foul
stagnant drainage



PLAN OF THE ABBATOIRS

WILLIAMSTOWN

SCALE 60 FEET TO 1 IN.

